



HAL
open science

Institutional change for the development of urban sanitation in the Global South: A social science review

Héloïse Valette, Marine Colon

► **To cite this version:**

Héloïse Valette, Marine Colon. Institutional change for the development of urban sanitation in the Global South: A social science review. *Utilities Policy*, 2024, 88, pp.101755. <10.1016/j.jup.2024.101755>. <hal-04561473>

HAL Id: hal-04561473

<https://hal.science/hal-04561473v1>

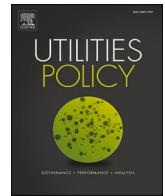
Submitted on 13 May 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons CC BY-NC-ND 4.0 - Attribution - Non-commercial use - No Derivative Works - International License



Full-length article

Institutional change for the development of urban sanitation in the Global South: A social science review

Héloïse Valette^{a,*}, Marine Colon^b^a UMR LISST, Department of Economic Sciences, University of Toulouse 2 Jean Jaurès, Maison de la Recherche, 5, Allée Antonio Machado, 31058, Cedex 9, Toulouse, France^b UMR G-EAU, Univ Montpellier, AgroParisTech, BRGM, Cirad, IRD, INRAE, Institut Agro, Montpellier, France

ARTICLE INFO

Handling editor: Janice A. Beecher

Keywords:

Sanitation in the urban Global South
Institutional change
Literature review

ABSTRACT

This paper analyses knowledge in social sciences about the conditions for and the process of institutional change in the urban sanitation sector in the Global South. We conducted a literature review of 148 papers. This review is organised around the six steps of institutional change proposed by Greenwood et al. (2002). Most studies focus on conditions and barriers to change, on the “legitimacy” of social or technological innovations, and the actors promoting change. The change process is rarely analysed from a long-term perspective, nor at the city scale, calling for further research.

Fundings

This work was supported by the AgroParisTech-SUEZ Chair “Water for All – General Management of Water and Sanitation Services”.

1. Introduction

According to the latest international statistics, 3.5 billion people worldwide still lack access to “safely managed sanitation facilities” (JMP, 2023). Among them, at least 419 million people continue to practice open defecation (op. cit.). Moreover, more than 80% of industrial and municipal wastewater is released into the environment without treatment (UN-Water, 2018). Deficiencies in sanitation raise risks for infectious diseases and mortality, especially for children, and translate into a broad range of livelihood and environmental issues (Cairncross 2018; Fawcett 2016). It also puts women at particular risk of aggression and shame (JMP, 2023).

This situation is a paradox. While the benefits of sanitation are known and scientifically proven, sanitation continues to suffer underinvestment and underdevelopment compared to water.¹ To explain this paradox, an increasing number of experts and academics are calling for a shift in attention from technological and financial issues to institutional

ones (Chenguelly, 2019). International, national and local actors have promoted diverse technological innovations to sustainably improve access to sanitation and, more broadly, the sector’s performance in the Global South (Kokko and Fischer, 2021). Unfortunately, many of them have failed (Muller 2020). Developing the sanitation sector requires appropriate technology, funding and management mechanisms, as well as institutional change. Institutions are the rules, representations, and norms that frame actors’ actions and support the sector’s development.

This paper aims to assess current social science knowledge about the change process needed within institutions to enable them to develop sanitation services. Sanitation here refers to collecting, transporting, and treating wastewater produced by human activities (water, solid waste management and drainage excluded). Institutional change is the process by which rules, values and norms are modified or created so that actors are given legitimacy, power, resources, and capacities to play their roles (Greenwood et al., 2002). We focus on two questions: 1) what are the initial conditions for change? and 2) who leads change, what changes are made, and through what process?

We conducted a literature review of 148 papers published in peer-reviewed social science journals to do so. Literature review here is defined as “published materials that provide an examination of recent or current published literature” (Grant and Booth, 2009: 97). We suggest

* Corresponding author.

E-mail addresses: heloise.valette@univ-tlse2.fr (H. Valette), marine.colon@agroparistech.fr (M. Colon).¹ For example, the Millennium Development Goal 7 water target was met in 2010, but not the sanitation one (JMP, 2021). Today, the UN estimates that if nothing changes, 2.8 billion people will not have access to sanitation by 2030 (UN, 2022).

that even if there is a growing interest in these questions, further research on institutional change in the field of sanitation is required to increase our knowledge on how to foster the development of the sector.

This paper is composed of five sections. Section 2 describes the main concepts considered and explains the need for this shift toward institutional change. Section 3 presents the research approach and the methodology used to analyse the papers. Section 4 presents the main findings organised around the steps of institutional change defined by Greenwood et al. (2002). Section 5 outlines the limitations and strengths of the study and opens perspectives for further research.

2. Urban sanitation in the Global South and institutional change

2.1. The face of urban sanitation in the Global South

Sanitation embraces two models that co-exist in many cities. The “gold standard” (Truffer, 2022: 11) is the leading model promoted worldwide and consists of a network of pipes collecting faeces from flush toilets. The sewer system transports wastewater up to a treatment plant from where treated water is released into the environment. Sludge is either reused or burnt. Many sewer systems in cities of the Global South date back to the colonial era and do not cover large portions of the urban population (McFarlane and Silver, 2017; Rijke-Epstein, 2019; Schramm, 2016; Swanson, 1977). Today, many rapidly growing cities struggle to invest in this capital-intensive infrastructure, particularly in the Global South. In sub-Saharan Africa, only 16% of the urban population can access sewerage, and only 30% of sludge reaches a wastewater treatment plant (JMP, 2021).

Consequently, the only options available to many people are open defecation or on-site sanitation. On-site sanitation is the collection of faeces in latrines that are evacuated by emptiers, who transport the sludge to faecal sludge treatment plants when these exist. While sewers are usually operated by formal operators, either public or private, depending on the location, latrine emptiers are entrepreneurs who are often informal operators (Zhang and Friedman, 2019). In most cases, on-site sanitation lacks economic, public health and environmental regulation, funding, and capacity, leading to poor sanitary conditions for urban dwellers, pollution, and difficult working conditions for sanitation workers (World Bank, ILO, Wateraid, WHO, 2019). In some places, small decentralised sewerage systems have been set up as an alternative to a centralised network and on-site sanitation (Muzioeva et al., 2022). The World Bank and the Bill and Melinda Gates Foundation have promoted the concept of Citywide Inclusive Sanitation by which urban sanitation policies and services should embrace not only centralised sewerage but also decentralised sewerage and on-site sanitation. This approach fuels the long-lasting debate about the appropriate sanitation model and its legitimacy. Beyond planning for these models at the city scale, attention should be paid to institutional issues: how sanitation infrastructures and attached services should be funded or financed and governed (Lawhon and McCreary, 2023; Lawhon et al., 2022).

2.2. The shift towards considering institutional change for sanitation

Technical, managerial, and financial factors are frequently cited to explain the sector’s underdevelopment. Developing sanitation services involves high capital investment costs (Fischer et al., 2021). According to the World Bank, around \$70 billion per year would be necessary to achieve SDG 6.2,² namely access to adequate and equitable sanitation and hygiene for all and end open defecation (Hutton and Varughese, 2016). However, sanitation receives insufficient attention and inadequate funding (Criqui, 2019). The funding model often uses donors’ funds for investment, while service management is supposed to be

covered by user fees. However, there is insufficient cost recovery linked to a lack of investment and an unwillingness or incapacity on the part of households to pay for the service (Paterson et al., 2007; Perard, 2018). In addition, the sanitation sector faces major technical and managerial issues, such as a lack of maintenance (Tumwebaze et al., 2013), non-functional infrastructure (Andersson et al., 2016; Silveti and Andersson, 2019; Whittington et al., 2020), and inadequate facilities that cannot meet users’ needs (Fischer et al., 2021; Joshi et al., 2011; Peprah et al., 2015; Simiyu 2016).

However, previous studies have highlighted that the core obstacles to developing sanitation beyond technical and financial issues are institutional (Colon and Rieu, 2022; Francois et al., 2021; Ménard, 2018; Valette and Colon, 2022). As Chenguelly (2019) notes, international funding agencies and NGOs are allocating more and more resources to institutional issues, which are vital to development. The concept of “institution” has several meanings. In everyday language, we generally refer to institutions to designate public organisations that play roles in policy design and implementation. Institutional economists add to this the idea that institutions are rules that govern social interaction. Institutions may be formal (laws and regulations) or informal (norms) (North, 1991). We argue that for sanitation, one must also consider representations, norms and beliefs that shape behaviours. Therefore, we will refer to the sociological concept of institutions defined by Scott (1995: 48) as “social structures that have attained a high degree of resilience [and are] composed of cultural-cognitive, normative, and regulative elements that, together with associated activities and resources, provide stability and meaning to social life.” Hence, institutions have three dimensions: cognitive, normative, and regulative.

Institutions are taken for granted and, therefore, are difficult to change. The sanitation sector here is apprehended as a field (Scott, 1995), meaning a set of actors interacting frequently and sharing common meanings. Formal rules, organisations, and funding are mainly directed to centralised network models within this field. Some authors argue that decentralised sanitation, including on-site sanitation, lacks formal rules, standards for building latrines, treatment, price controls, where sludge is disposed of, and protection rules for informal workers who empty and transport sludge (Mason et al., 2020). There may, however, be informal institutions that are also difficult to change.

This literature review enabled us to identify three main institutional barriers to the development of sanitation, detailed below.

- (i) A key explanation of the underdevelopment of sanitation deals with the cognitive and normative dimensions of institutions. Sanitation is surrounded by taboos and remains a private and intimate aspect of social life (Black and Fawcett, 2010; Rosenquist, 2005) or even a problem (Ober, 2019); hence, a social demand emerges uncomfortably (Criqui, 2019). While providing water to supply cities is perceived as a collective problem and has led to the development of public water services, in many places, managing faeces remains an individual problem that public authorities do not tackle. Regarding sanitation as a private issue, it creates substantial public health and environmental problems (Chidambaram, 2020). The taboo surrounding sanitation may explain the lack of political will and commitment, a central barrier to the sector’s development (Criqui, 2019; Cummings et al., 2016; Mara, 2012).
- (ii) A consequence of considering sanitation as a private problem is a legal framework that is limited, incomplete, and lacking means for enforcement or corruption control, i.e., the regulatory dimension of institutions (Francois et al., 2021; Lerebours et al., 2021; Weststrate et al., 2019). For instance, some decentralisation reforms have transferred responsibility for sanitation to local government levels without transferring resources (Mason et al., 2020). Overlapping rules and responsibilities hamper the coordination and cooperation needed between actors (Mara et al., 2007; Seroa da Motta and Moreira, 2006). Typically, legal

² The “Sustainable Development Goals,” adopted by the United Nations in 2015.

frameworks for on-site sanitation are particularly limited or inadequate (Mason et al., 2020). The informal character of sanitation workers and urban dwellers living on property with no formal land tenure adds another layer of complexity (Scott et al., 2015; Sinharoy et al., 2019). In addition, as sanitation is a local issue, rules defined at the national level might not fit local contexts and prevent local solutions from emerging, such as opting for decentralised systems (Vélez-Ramírez et al., 2022).

- (iii) A consequence of the previously identified barriers is key actors' lack of capacity, resources, and power to play their roles. Local authorities in charge of sanitation often lack capacity and resources (Chenguelly, 2019; Vélez-Ramírez et al., 2022). Working conditions and social recognition are limited, and the field suffers from a lack of attractiveness. The overlaps and competition around sector leadership, especially at national and decentralised levels (Mason et al., 2020), and more broadly, a lack of coordination between public authorities as well as among donors, is denounced (Sinharoy et al., 2019; WSP, 2011). Finally, improving the "voice" of users and encouraging the participation of community-led organisations through the coproduction of public action to manage sanitation infrastructure may be, for some authors, a way to build agency for the development of the sector (Francois et al., 2021; McFarlane, 2023; McGranahan, 2015; McGranahan and Mitlin, 2016). In this process, like for water supply, among users, women play a specific role in the sanitation chain that must be considered to set up adequate and legitimate sanitation solutions (Panchang, 2021). Institutional barriers to developing the sector can only be overcome through an institutional change process.

2.3. Institutional change

Tackling the issue of institutional change for the development of sanitation relies on analysing the process by which infrastructure and associated rules, organisations, professional associations, representations, beliefs, norms, and news practices become institutionalised, meaning taken for granted and not disputed. As explored by Kokko and Fischer (2021), innovation in sanitation services may be new practices and representations of what has to be done associated with a new technology, in their case, the "peepoo bag," as an alternative to latrines. Institutional change is supposed to address institutional barriers highlighted in the previous section. How can changes be brought about when tackling rules, representations, and norms?

Neo-institutional sociologists have conceptualised an institutional change process (Greenwood et al., 2002). They suggest that institutional change unfolds in six steps.

- Step 1: An initial shock initiates change, such as social or technological innovation, crisis (war, epidemics), new regulations, and new social expectations.
- Step 2: New actors emerge, strive to lead change, and try to promote new institutions. They are called "institutional entrepreneurs" (DiMaggio and Zucker, 1988).
- Step 3: Institutional entrepreneurs develop their innovation and try to prove its technical viability.
- Step 4: Theorization phase through which a discourse is built to give the innovation "pragmatic legitimacy" (functional superiority of the innovation, such as flush toilets considered as functioning better than pit latrines in some cities).
- Step 5: Diffusion by which the innovation gains "cognitive legitimacy" (that is it becomes, undisputed, and taken for granted, such as having toilets at home in some countries).

- Step 6: Institutionalising the innovation that becomes something taken for granted (or vanishes like "fads and fashions").

Some authors characterise the institutional change process as messy and complex and probably not as linear as presented by theoreticians (Chenguelly, 2019; Colon, 2018). We will focus on the following items of the process: how it is initiated (step 1), who the institutional entrepreneurs are and the conditions needed for them to convince others (steps 2 and 3), what innovations are promoted and their conditions to gain legitimacy (steps 3 to 5), and how the process of change may unfold. This conceptual framework is used in this paper to analyse the literature review.

3. Research approach

The paper draws from a review of 148 works of sanitation literature. This section first exposes the rationale for this additional literature review. We then detail the methodology used to conduct the literature review. By accounting for current knowledge, we aim to identify gaps to open perspectives for further research. The methodology is presented by referring to the SALSA framework, which provides a sequence of steps: search, appraisal, synthesis, and analysis (Grant and Booth, 2009).

3.1. The relevance of an additional literature review

Earlier literature reviews gathered major social science works on sanitation (Muzioreva et al., 2022; Rosenqvist et al., 2016; Sinharoy et al., 2019; Van Vliet et al., 2011). Some of them deal with particular issues, namely on-street sanitation facilities in Northern contexts (Moreira et al., 2021), decentralised wastewater system practices (Muzioreva et al., 2022), and community-led total sanitation policies in Southern contexts (Venkataramanan et al., 2018). We aim to grasp a more comprehensive approach to developing sanitation services. Rosenqvist et al. (2016) provide insights into how the notion of sanitation has been transformed over time, introducing several perspectives on sanitation, which have ranged from a focus on basic human needs in the 1980s to a focus on sustainable sanitation systems in the mid-2000s. Although this work provides valuable insights into lexical change over time, it does not focus on conditions for change in the sector. The main review mentioning institutional issues is that of Sinharoy et al. (2019). They discuss the key drivers and barriers to water supply and sanitation, including institutional ones. Their approach to institutional factors mainly focuses on formal rules and coordination among donors and public actors, one of the aspects we also consider here. The main review tackling the change issue is that of Van Vliet et al. (2010). They highlight three topics relevant to the sanitation challenge: the nature of "socio-technical change", the issue of multi-level governance and the role of the citizen-consumer. Tackling institutional change enables one to articulate these three issues, as change in institutions relies on changing a socio-technical system, change may occur at micro, meso, and macro levels of governance, and change involves users who will ultimately legitimate the innovation. The paper aims to draw on these existing studies, focusing on institutional change processes in urban sanitation in the Global South.

3.2. Methodology

3.2.1. The search step

The search step entails finding the items relevant to the question. The relevance was based on the following five criteria: papers published in peer-reviewed journals, in social sciences, drafted in English, up to 2020, considering urban areas of the Global South and sanitation.

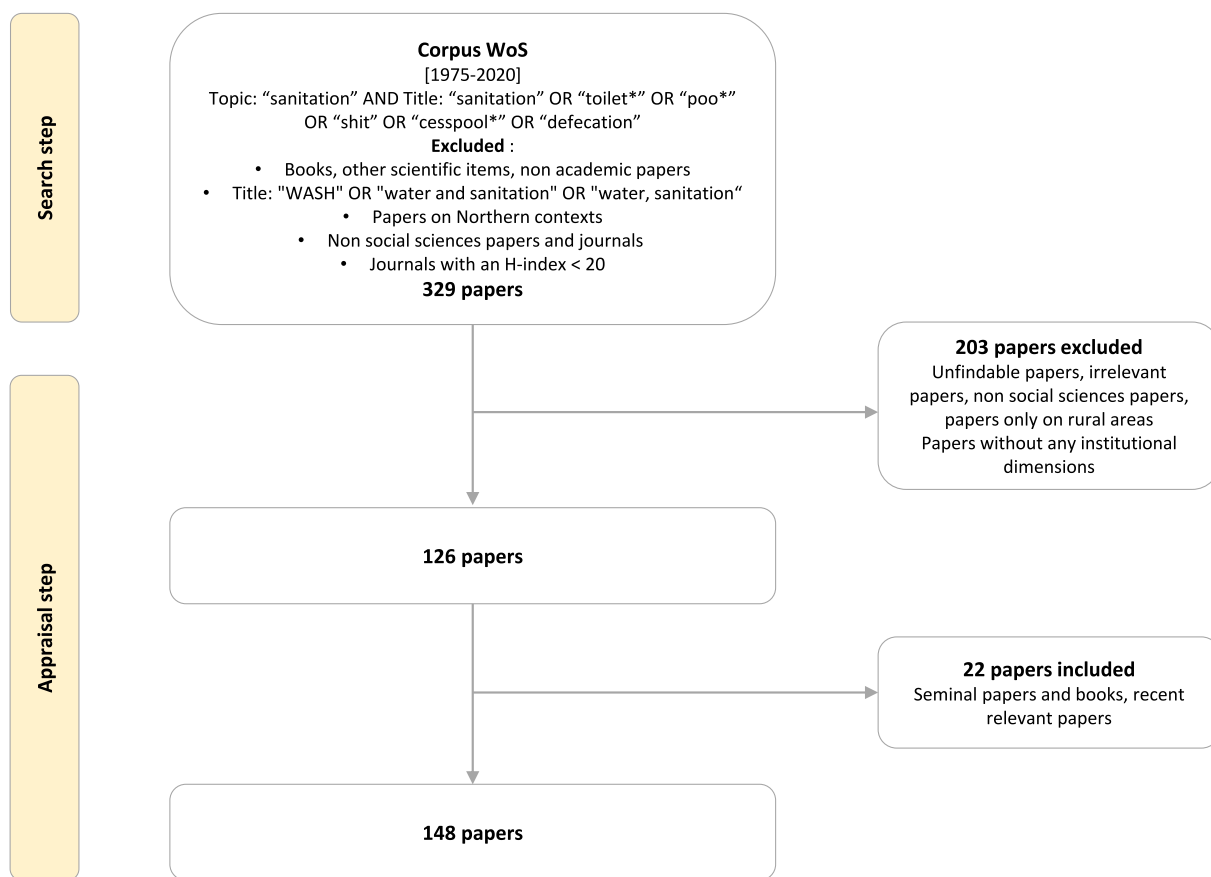


Fig. 1. Search and appraisal process.

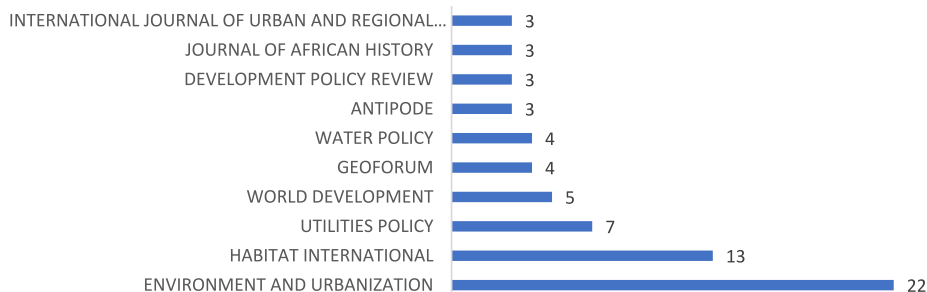


Fig. 2. The top ten journals represented in the corpus (number of selected papers per journal).

We created a corpus with the help of the Web of Science database, a well-recognised scientific platform. The search string TOPIC with the keyword “sanitation” and TITLE keywords “sanitation” OR “toilet*” OR “poo*” OR “shit” OR “cesspool*” OR “defecation” was applied. We excluded books, other scientific items and non-academic literature. We also excluded the keywords "WASH" OR "water and sanitation" OR "water, sanitation" in the title search to analyse the specificity of papers on sanitation issues. Indeed, when sanitation is not the sole focus in most of the papers, it is under-addressed compared to water issues (Ellis and Feris, 2014). A challenge was to identify which papers are considered social science papers. To tackle this, we checked the option in the Web of Science “Social Sciences Citation Index” and excluded the Web of Science categories, which did not deal with social science aspects such as medical, epidemiological, and biological literature. We also excluded non-social sciences journals based on each journal’s “subject area and

category” indicated in the Scimago Journal and Country Rank.³ We dismissed papers on Northern contexts. Finally, we assumed that publication in peer-reviewed journals would guarantee the scientific quality of studies, and we selected journals with an H-index of more than 20 to keep only ranked publications. This initial search gave 329 results (see Fig. 1 hereafter).

3.2.2. The appraisal step

The appraisal step does not involve an assessment of the quality of selected items but an assessment of the relevance of the selected items. We defined exclusion and inclusion criteria to ensure the relevance of the selected items to our question.

³ Scimago Journal & Country Rank (scimagojr.com).

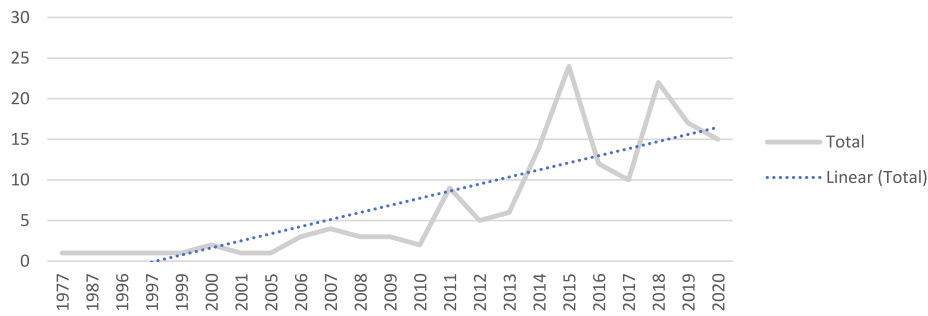


Fig. 3. Distribution of selected papers in time (1977–2020).

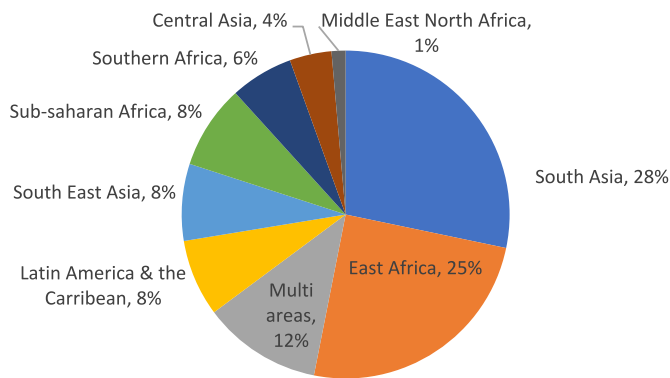


Fig. 4. Distribution of items according to geographical areas (excluding aspatial items).

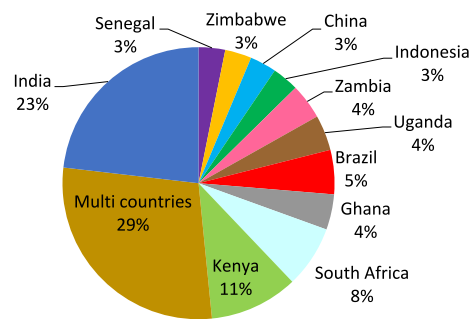


Fig. 5. Top countries represented (excluding aspatial) in selected items.

We excluded papers that were unavailable, papers irrelevant to our topic, and papers dealing mainly with water issues. We also dismissed papers without any institutional dimensions. This screening reduced the number of papers from 329 to 126 papers. Following the snowball sampling method, we manually reinserted relevant papers on the subject into the database or quoted many times in papers included in our database (Noy, 2008). We finally obtained a corpus of 148 papers (see Fig. 1).

3.2.3. The synthesis step

Data are extracted from the WoS database and entered into an Excel spreadsheet. We added the following categories per item to proceed with the synthesis and analysis of the materials. First, since most papers are empirical, the first criterion was to locate the case studies. For each item, we attached geographical area(s) (ex. South East Asia) and country(ies). Secondly, since the focus was on urban areas, we characterised the type of urban space of the case study(ies) (poor urban areas, city scale studies, aspatial, others) (see Fig. 6). We identified general trends from this corpus.

The top ten journals represented in the corpus are presented in Fig. 2.

Over the last 15 years, there has been a significant rise in interest in sanitation issues in social science literature (Fig. 3). This period coincides with several events related to sanitation, such as the 2010 recognition of the human right to water and sanitation by the United Nations General Assembly and the MDG assessment in 2015, which revealed that the access to sanitation target had not been met, unlike the water target.

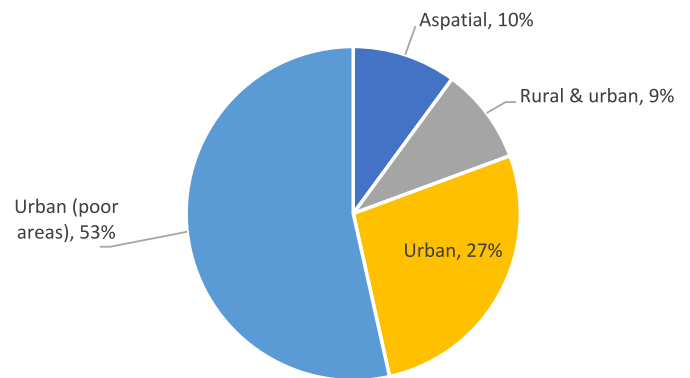


Fig. 6. Distribution of selected items according to the type of space (urban versus rural) targeted in papers.

Second, we observe an over-representation of some geographical areas (South Asia, East Africa) and countries (India, Kenya) (Fig. 4. & Fig. 5.). One explanation could be that these countries are large English-speaking countries, and the corpus was created in English.

Thirdly, most of the papers (53%) on urban areas are focused on poor areas, such as informal settlements or slums (Fig. 6.).

We also identified key research areas. We intentionally broadened our analysis to encompass various social science disciplines to incorporate multidisciplinary research into our study and highlight outcomes beyond disciplinary analysis. Development studies dominate this corpus, followed by geography and environmental studies (Fig. 7.).

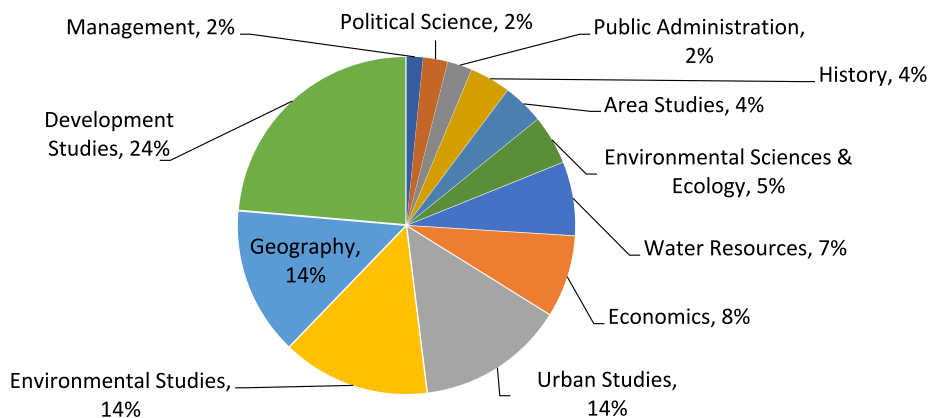


Fig. 7. Distribution of collected items according to research areas.

3.2.4. The analysis step

The analysis of the selected items relies on the conceptual framework of institutional change (see section 2.3). A short synthesis of what we learn from each step of institutional change was drafted for each paper. We see how institutional change unfolds, but we also include limitations due to the location of case studies.

4. Findings

4.1. Step 1: Initiating institutional change

While accounts of sanitation development in Northern cities have highlighted the role of initial shocks such as wars, epidemics, and new reforms (Barraqué, 2014; Geels, 2006), surprisingly, few studies of Southern cities have considered such factors. An exception would be studies of sanitation reform in India in the 19th century, driven by epidemics, the deterioration of sanitary conditions of urban dwellers, and rapid urbanisation (Chaplin, 1999).

The primary impulse for change outlined in the literature involves promoting new governance models by exogenous actors (donors, NGOs). These models represent what needs to be done based on ideas legitimated in their realm. They often promote not only new technology, mainly off-grid systems, but also the introduction of new rules and representations. For example, the World Bank strongly promotes wastewater and faecal sludge recovery through a circular economy approach and establishing a sanitation market to initiate a process of institutional change (Moya et al., 2019; Öberg et al., 2014; Rao et al., 2017; Rodriguez et al., 2020). In this sense, Öberg et al. (2014) argue that the sector will develop once sewage is considered a resource, not waste, and waste is considered a generator of revenue rather than costs. This call for a change in mindsets may be considered the starting point of institutional change processes. Other papers analyse the enabling conditions for establishing a sanitation market with cost recovery (Rao et al., 2017). However, Moya et al. (2019) point out that barriers are linked more with sludge collection management and regulatory restrictions on using human waste as fertilizer than with beliefs or representations, hence the need to change the formal rules. However, few papers on this type of attempt to initiate an institutional change have reported on what happens once new models are promoted in various countries.

Institutional change may also be initiated through new institutional arrangements. This area is mainly covered by studies of the role of the private sector as an opportunity to develop sanitation services (Mara et al., 2007; O'Keefe et al., 2015). Concerning sewage networks and decentralised sanitation systems, this topic is well-studied in some countries, such as Brazil (Sabbioni, 2008; Saiani and de Azevedo, 2018; Seroa da Motta and Moreira, 2006). Seroa da Motta and Moreira (2006) show that the territorial scale of sanitation management explains the sanitation sector's productivity better than the service provider's

ownership structure. Finally, without appropriate regulatory frameworks, the private sector's contribution appears limited to implementing new large-scale sanitation systems.

Surprisingly, few changes have been initiated through the emergence of new expectations by urban dwellers, with the notable exception of poor urban dwellers fighting for their civil rights in middle-income countries (South Africa, Argentina) (del Carmen Morales et al., 2014; McFarlane and Silver, 2017; Robins, 2014). In these cases, the social demands are for the same type of flush toilets as those in more well-off areas (see step 3.).

Finally, the lack of political will to push through reforms is often seen as one of the main barriers to initiating change (Criqui, 2019). Surprisingly, we found few works on the impact of sanitation reforms in urban areas of India, even though ambitious policy programmes have been initiated (Swachh Bharat). Most focused on rural areas and were not included in the corpus.

4.2. Steps 2 and 3: The key role of institutional entrepreneurs (step 2 and 3)

Several case studies show that the development of sanitation systems in low and middle-income countries occurs through the intervention of institutional entrepreneurs. Institutional entrepreneurs may be community-based organisations, NGOs, experts, international networks, political leaders, or donors. In transitions and innovation studies, institutional entrepreneurs are studied as intermediaries contributing to the generation, diffusion, and use of a what they call a new "socio-technical innovation" (Van Welie et al., 2020; van Welie and Romijn, 2018). They aim to remove institutional barriers and increase the legitimacy of innovation through articulating needs from a long-term perspective and facilitating a project or the learning process (op. cit.).

The first condition for institutional entrepreneurs to bring about change is to gain local and political legitimacy (Fischer et al., 2021; Kokko and Fischer, 2021). The local legitimacy issue has been well explored in the literature on participation (Davis et al., 2019; Hendriksen et al., 2012; Nance and Ortolano, 2007; Spronk, 2009). It emphasises the central role of local actors in the sustainable use and management of sanitation systems. Trust in and the social capital of intermediary organisations and actors are essential to successfully implementing sanitation systems (Chidambaram, 2020; Tomlinson, 2015). In contrast, an ex-nihilo development project without local legitimacy is likelier to fail. Chenguelly (2019) even argues that institutional change requires local authorities' full ownership and leadership of the project. For example, Tomlinson (2015) analyses the success of the sustainable implantation of block toilets in the slums of Pune (India) thanks to the involvement of institutional entrepreneurs, named "champions," one of whom was a local political leader. However, this experience failed when the model was scaled up at the national level

through the National Urban Sanitation Policy because key actors changed, and the innovation lacked local legitimacy. Institutional entrepreneurs must also gain legitimacy from political leaders and decision-makers. Fisher and her colleagues (Fischer et al., 2021; Kokko and Fischer, 2021) have studied the failure of a niche innovation, the “peepoo bag,” a biodegradable toilet bag that absorbs and breaks down pathogens that can be used in densely populated settlements where people engage in open defecation. The adoption and institutionalisation of this innovation failed because it was not promoted by intermediaries nor given legitimacy by actors with political influence, more precisely, development aid actors. This perspective aligns with many authors’ view that political commitment is the key to successful change in the sector (Mara, 2012; Mitlin, 2015). It also encourages institutional entrepreneurs who are not local to avoid bypassing local authorities.

4.3. Steps 3 to 5: The legitimacy of the innovation promoted: a focus on acceptable toilets

According to our conceptual framework, a condition for institutional change is the legitimacy of the innovation, first pragmatic, meaning proof that it really works better, and then cognitive in that it is acceptable to users. The body of literature addressing the issue of earning “pragmatic legitimacy” focuses on access to toilets in vulnerable areas. The papers highlight that to achieve pragmatic legitimacy, an innovation must meet users’ needs and be feasible. The needs mentioned in the literature are well established. These include safe, easily accessible, well-located (distance, open day and night), and clean facilities (Chidambaram, 2020; Simiyu, 2016), with privacy (Bardosh, 2015; Mitlin, 2015; Muller, 2020; Prabaharyaka, 2020; Satterthwaite et al., 2015a). These needs vary according to individual factors (gender, age), geographical factors (sparsely or densely populated territories, lowland or rugged areas) (Satterthwaite et al., 2015b), socioeconomic factors (belonging to a marginalised group, income level, social status) or according to the season (Bardosh, 2015; Simiyu, 2016). Many case studies show failures of institutional change in the sanitation sector due to a mismatch between the innovation promoted and the needs of households (Fischer et al., 2021; Joshi et al., 2011; Peprah et al., 2015; Simiyu, 2016). In addition to meeting needs, and as we mentioned in section 2.1., the innovation must be recognised as being feasible from a technical, managerial, financial and land tenure perspective (Perard, 2018; Tumwebaze et al., 2013). In informal settlements, tenure insecurity is the main barrier to setting up toilets (Joshi et al., 2011; McFarlane, 2023; Satterthwaite et al., 2015a; Scott et al., 2015). The risk of eviction by the local government or by a landowner renders households reluctant to invest in sustainable sanitation solutions (McGranahan, 2015; Satterthwaite et al., 2015b; Scott et al., 2015; Sinharoy et al., 2019).

Another issue related to gaining legitimacy involves cultural-cognitive institutions attached to technology. Many studies show that the cognitive barrier is significant in developing sanitation (Fawcett, 2016; Kokko and Fischer, 2021). Scholars have identified flush toilets within homes as an ideal of modernity or citizenship and a symbol of dignity (del Carmen Morales et al., 2014; McFarlane and Silver, 2017; Robins, 2014), which may explain the failure to promote on-site sanitation systems. In some cases, the ideal of modernity contributes to the shift from a “pragmatic legitimacy” to a “cognitive legitimacy”. Some case studies note that there is a social demand for the state to get involved in developing wastewater and sludge management as sanitation becomes a public rather than a private issue. Non-flush toilets, often promoted in poor areas by donors, are a synonym for underdeveloped and backward lifestyles because they require manual sludge management in areas where mechanical emptying is not feasible due to lack of space. Here, the ideal of modernity clashes with other representations, partly explaining the abandonment of facilities. More recent works temper these findings by pointing to a progressive acceptance of heterogeneous off-grid systems beyond the modern/anti-modern ideal, particularly with the introduction of technologies such as guplers (i.e., a

small pump to withdraw faecal sludge from latrines) (Lawhon and McCreary, 2023; Lawhon et al., 2022). Thus, effective sludge collection services seem essential for overcoming cognitive barriers to accepting non-flush toilets (Silveti and Andersson, 2019).

Few scholars seem to have studied how to convince sanitation authorities that the perceived legitimacy of innovation is crucial for acceptance.

4.4. How is innovation institutionalised?

Considering the stages of institutional change proposed by Greenwood et al. (2002), no case study considers the entire institutionalisation process of the sanitation sector (except Tomlinson, 2015). The assumption is that few cities have successfully created fully functional public sanitation services over their entire territory. In most cases, the first steps of institutional change occur (emergence of new institutional entrepreneurs, promoting an innovation, steps 2 and 3, respectively), and sometimes, the process of the legitimacy of the innovation is ongoing (step 4). Institutional change for sanitation development may start with promoting an innovation involving new institutions (such as organisational arrangements, rules, practices, representations, and norms). Some case studies explore the conditions needed for scaling up innovations, especially technological ones (Cameron et al., 2019; Raymond et al., 2018; Tomlinson, 2015). Not one but a combination of prerequisites are needed to scale up: political commitment, financial resources, legitimacy of the innovation, legitimacy of institutional entrepreneurs, favourable institutional arrangements, and sustainability of the management model. According to Davis et al. (2019), community participation in the identification of sanitation priorities, the involvement of local authorities and actions targeting behavioural change are conditions for scaling up.

Regarding community participation, some authors argue that the involvement of communities in decision-making processes and their ability to influence political leaders are essential for the effective development of the sanitation sector, the maintenance of functional toilets, and the sustainable management of infrastructure (Dickin et al., 2017; McGranahan, 2015; Nance and Ortolano, 2007). The development of on-site toilets also depends on the participation of communities in operation and maintenance activities throughout the sanitation chain (Davis et al., 2019; Simiyu, 2016; Tumwebaze et al., 2014). However, community participation is bound to be limited when scaling up innovations.

Fewer studies have analysed the adoption of new institutional arrangements, although these are widely documented as the first step of change. In addition to implementing new technology, institutionalisation requires adjustments to formal rules, the development of norms and representations, and the recognition of sanitation workers.

5. Conclusion

5.1. Limitations

This literature review has three main limitations. One relates to the corpus’ composition. Grey literature has not been systematically included, even though operational work relates to institutional change within the sanitation sector (WSP, 2011). It also only includes papers written in English, resulting in an over-representation of some countries (India, South Africa, East African countries) and an under-representation of other geographical areas, notably Arab, French, Portuguese-speaking African and Latin American countries. The over-representation could coincide with ambitious national sanitation programs (such as the Swachh Bharat program in India) or research programs (such as the PROVIDES program on urban sanitation in East Africa⁴).

⁴ www.provideafrica.org.

In contrast, the under-representation of the Middle East and North Africa in the English-language literature could be explained by the fact that sanitation may also be considered less worthy of interest than other subjects that have reconfigured societies, such as the Arab Spring. A perspective would be to conduct case studies in such countries to provide insights into whether such gaps are attributable to publication process issues (language, choice of journals) or political and academic indifference. In addition, [Grant and Booth \(2009\)](#) highlight a bias inherent in the composition of the corpus in literature reviews: the fact that the authors' conclusions may omit significant parts of the literature, particularly by selecting literature that supports their view. This review synthesises a wide range of literature on sanitation development in the Global South. However, we acknowledge that this review is inherently incomplete.

Secondly, investigating institutional change entails analysing a dynamic process, whereas a literature review is based on papers that do not necessarily investigate processes but rather the state of the sector at a given time. Therefore, the process of institutionalisation might be more comprehensive in practice than in the papers in the corpus. The temporal dimension is also a challenge because research programs typically run over a few years, which rarely matches the timeframe of institutional change. Long-term citywide studies are challenging also for it requires to collect data on large territories over a long period of time.

Finally, this review focuses on institutional change, while few papers explicitly target this issue. Indeed, due to the methodological choice to encompass all social science disciplines dealing with sanitation, many cognitive and normative change papers do not refer to the concept of institution.

5.2. Strengths and perspectives

One strength of this literature review is its original approach, which considers the conditions for change and the process of institutional change in the sanitation sector, an issue that has been neglected compared to the drinking water sector in the Global South ([Criqui, 2019](#); [Ellis and Feris, 2014](#)). While the literature has identified the barriers to developing sanitation, our paper highlights the lack of research on change processes in urban areas.

This finding opens up several perspectives for further research, another strength of the analysis. A first perspective addresses the need to better understand the shift from studying small-scale on-site sanitation to embracing the process of setting up institutions to manage various sanitation options at the city scale. There is a growing interest from some international institutions and donors, such as the World Bank and the Bill and Melinda Gates Foundation, but also from some scholars, to promote the City-Wide Inclusive Sanitation approach, in line with the achievements of the SDG 6 on water and sanitation ([Lüthi et al., 2020](#); [Scott et al., 2015](#)). This approach invites cities to develop comprehensive approaches to sanitation improvement that encompass long-term planning, social and technological innovations, institutional reforms, and financial mobilization at the entire city scale. However, most papers focus mainly on urban poor areas and slums. Probably because of practical feasibility, few works ([Lawhon et al., 2022](#); [Scott et al., 2015](#); [Scott and Cotton, 2020](#)) provide insights into the coherence of the entire sanitation system at the city scale and even beyond where wastewater is discharged. It also means that the role of formal operators in providing sanitation services in coordination with small-scale actors is often overlooked. This recent attention by the international agenda may represent an opportunity to revitalize research on institutional change at this scale. [Lawhon et al. \(2022\)](#) similarly explore new institutional arrangements between the primary sanitation operator and other sanitation actors. They note a shift in the way heterogeneous urban infrastructure is governed. Analysing the governance of polycentric socio-technical systems, designating the coexistence of a sewer with a dedicated operator, and decentralised sanitation systems and on-site sanitation in a system is a way forward ([Truffer, 2022](#)). It raises issues

regarding regulation, funding mechanisms for sustainability, and safe management of the multiple sanitation services provided in a city. Finally, analysing the city scale also provides a way of thinking about the whole sanitation chain, including faecal sludge management from collection to treatment, rather than simply access to toilets.

From an institutional change perspective, considering the entire sanitation service chain also implies questioning how informal workers may be integrated into formal systems. The institutionalisation of the sanitation sector relies on the professionalisation of sanitation workers and the regulation of working conditions. This topic has recently fallen under the spotlight of international organisations ([World Bank, ILO, Wateraid, WHO, 2019](#)) and in academic papers ([Holm et al., 2018](#); [Lawhon et al., 2022](#); [Xess and Zerah, 2017](#); [Zaqout et al., 2020](#); [Zhang and Friedman, 2019](#)). A need exists to understand how the shift from an informal or illegal activity to a more formalised activity unfolds. Concerning basic human rights, improvements in livelihoods, and working conditions of sanitary workers are also crucial.

Another perspective relies on the nature of innovation analysed in the literature. Most institutional change analyses focus on how institutions have evolved to manage existing infrastructure, such as sewers, or how new technological solutions may become institutionalised and co-exist with sewers. We argue that organisational and institutional change associated with the development of sanitation infrastructures should be considered and analysed using a long-term perspective. Transitions studies and socio-technical approaches ([Geels, 2006](#); [Van Welie et al., 2020](#)) seem relevant to better understand what the diffusion of technological innovation implies so that it can be scaled up and how it can be articulated with other sanitation services within cities. These approaches could be enriched with institutional approaches to decipher how to better organize existing sanitation services, especially when it comes to on-site sanitation, and with analyses on the various existing regulations, including those related to the environment, public health, and economics.

Beyond the diffusion of socio-technical innovations, we call for more case studies on the institutionalisation process of new rules, institutional arrangements, norms and representations. While many case studies have explored this issue in the water sector, much less work has been done on the sanitation sector. Urban areas have a wide diversity of sanitation providers and many market opportunities ([Holm et al., 2018](#)). We need to better understand the conditions for this economy to develop. The private sector plays a substantial role. We note that there is much less controversy and debate about private sector participation in the sanitation sector than in the water sector literature. In practice, the challenge is to engage the public sector as part of its mission to provide sanitation services in partnership with operators.

A fifth perspective could enrich further studies on the institutional change of the sector. The influence of global crises, especially the COVID-19 pandemic, as an external shock on the institutional environment, could be studied in the development and the institutionalisation of sanitation systems. Climate change is another influential global crisis, forcing cities to elaborate adaptation strategies to improve their resilience. Sanitation is critical when it comes to extreme events such as flooding and drought, and it should contribute to either protecting water resources or providing alternative water sources.

Finally, gender specificities could be better analysed in works on institutional change. Indeed, although gender inequalities regarding access to sanitation are well identified ([Kohler et al., 2013](#)), and even though women are considered crucial actors of change, we surprisingly found very few studies that specifically address sanitation and gender in urban contexts ([Panchang, 2021](#)).

We recommend conducting longitudinal and in-depth case studies at the city scale level regarding practical implications. This approach might include qualitative surveys involving sanitation actors from the macro (institution creators), meso (translators of rules into operational action), and micro levels (urban decision-makers and operators). This research could focus on different stages in the sector's development.

Archival work may help to conduct a historical approach. Looking at the city scale implies mapping infrastructure development, either for on-site sanitation decentralised or centralised sewerage. Socio-technical approaches seem relevant in identifying how institutions evolve along with infrastructure development.

CRedit authorship contribution statement

Héloïse Valette: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Marine Colon:** Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgments

We are grateful for the valuable suggestions of the editors and reviewers. We would also like to thank all the members of the AgroParisTech-Suez Chair Scientific Committee for their careful reading and useful comments on the first version of this article: Pierre Bauby, Sarah Botton, Lætitia Guérin-Schneider, Pierre-Louis Mayaux, Claude Ménard, Thierry Rieu and Marie-Hélène Zérah.

References

- Andersson, K., Dickin, S., Rosemarin, A., 2016. Towards 'sustainable' sanitation: challenges and opportunities in urban areas. *Sustainability* 8, 1289. <https://doi.org/10.3390/su8121289>.
- Bardosh, K., 2015. Achieving 'total sanitation' in rural African geographies: poverty, participation and pit latrines in eastern Zambia. *Geoforum* 66, 53–63. <https://doi.org/10.1016/j.geoforum.2015.09.004>.
- Barraqué, B., 2014. Pour une histoire des services d'eau et d'assainissement en Europe et en Amérique du Nord. *Flux* 97–98, 4–15. <https://doi.org/10.3917/flux.097.0004>.
- Black, M., Fawcett, B., 2010. *The Last Taboo: Opening the Door on the Global Sanitation Crisis*. Routledge, Abingdon, Oxfordshire.
- Cairncross, S., 2018. The public health benefits of urban sanitation in low and middle income countries. *Util. Pol.* 51 (March), 82–88. <https://doi.org/10.1016/j.jup.2018.03.001>.
- Cameron, L., Olivia, S., Shah, M., 2019. Scaling up sanitation: evidence from an RCT in Indonesia. *J. Dev. Econ.* 138, 1–16. <https://doi.org/10.1016/j.jdeveco.2018.12.001>.
- Chaplin, S.E., 1999. Cities, sewers and poverty: India's politics of sanitation. *Environ. Urbanization* 11 (1), 145–158. <https://doi.org/10.1177/095624789901100123>.
- Chenguelly, S., 2019. Institutional change in the urban WASH sector A review of theory and practice. In: Drabble, S., Renouf, R. (Eds.), *WSUP, Discussion Paper*, London. <https://www.wsup.com/content/uploads/2019/03/DP012-Institutional-change-in-the-urban-WASH-sector.pdf>.
- Chidambaram, S., 2020. How do institutions and infrastructure affect mobilization around public toilets vs. Piped water? Examining intra-slum patterns of collective action in Delhi, India. *World Dev.* 132, 104984. <https://doi.org/10.1016/j.worlddev.2020.104984>.
- Colon, M., 2018. *Le contrôle de gestion dans l'analyse institutionnelle. Les contrats de performance dans le secteur de l'eau ougandais*. Presse des Mines, Paris, ISBN 978-2-35671-493-0.
- Colon, M., Rieu, T., 2022. Overcoming Institutional and Organisational Barriers to Sanitation: What's New? Technical Paper. French Development Agency, Paris. <https://www.afd.fr/en/rt68-va-barriers-to-sanitation-colon-rieu-botton-gaudry>.
- Criqui, L., 2019. Sanitation in developing cities: from politics to policies. *Issue Brief, IDDRI*, 09 18, 1–4.
- Cummings, C., Langdown, I., Hart, T., 2016. *What drives reform? Making sanitation a political priority in secondary cities*. Report. Overseas Development Institute, London.
- Davis, A., Javernick-Will, A., Sherri, M., Cook, S.M., 2019. The use of qualitative comparative analysis to identify pathways to successful and failed sanitation systems. *Sci. Total Environ.* 663, 507–517. <https://doi.org/10.1016/j.scitotenv.2019.01.291>.
- Del Carmen Morales, M., Harris, L., Öberg, G., 2014. Citizenshit: the right to flush and the urban sanitation imaginary. *Environ. Plann.* 46 (12), 2816–2833. <https://doi.org/10.1068/a130331p>.
- Dickin, S., Bisung, E., Savadogo, K., 2017. Sanitation and the commons: the role of collective action in sanitation use. *Geoforum* 86, 118–126. <https://doi.org/10.1016/j.geoforum.2017.09.009>.
- DiMaggio, P., Zucker, L.G., 1988. Interest and agency in institutional theory. In: Zucker, L.G. (Ed.), *Institutional Patterns and Organizations: Culture and Environment*, MA. Ballinger, Cambridge, pp. 3–21.
- Ellis, K., Feris, L., 2014. The right to sanitation: time to delink from the right to water. *Hum. Right Q.* 36 (3), 607–629. <https://doi.org/10.1353/hrq.2014.0038>.
- Fawcett, B., 2016. Shit in developing cities: a World of Ill health, indignity, violence, and death. *S. Atl. Q.* 115 (4), 763–770. <https://doi.org/10.1215/00382876-3656169>.
- Fischer, K., Kokko, S., McConville, J., 2021. No legitimacy: a study of private sector sanitation development in the Global South. *Environ. Innov. Soc. Transit.* 38, 68–78. <https://doi.org/10.1016/j.eist.2020.11.006>.
- Francois, J.N., Kakeu, J., Kouame, C., 2021. Do better institutions broaden access to sanitation in sub-sahara Africa? *Contemp. Econ. Pol.* 39 (2), 435–452. <https://doi.org/10.1111/coep.12512>.
- Geels, F.W., 2006. The hygienic transition from cesspools to sewer systems (1840-1930): the dynamics of regime transformation. *Res. Pol.* 35 (7), 1069–1082. <https://doi.org/10.1016/j.respol.2006.06.001>.
- Grant, M.J., Booth, A., 2009. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Inf. Libr. J.* 26 (2), 91–108. <https://doi.org/10.1111/j.1471-1842.2009.00848.x>.
- Greenwood, R., Suddaby, R., Hinings, C.R., 2002. Theorizing change: the role of professional associations in the transformation of institutionalized fields. *Acad. Manag. J.* 45 (1), 58–80. <https://doi.org/10.2307/3069285>.
- Hendriksen, A., Tukahirwa, J., Oosterveer, P., Mol, A., 2012. Participatory decision making for sanitation improvements in unplanned urban settlements in East Africa. *J. Environ. Dev.* 21 (1), 98–119. <https://doi.org/10.1016/j.cities.2012.03.007>.
- Holm, R.H., Kamangira, A., Tembo, M., Kasulo, V., Kandaya, H., Gijs Van Enk, P., Velzeboer, A., 2018. Sanitation service delivery in smaller urban areas (Mzuzu and Karonga, Malawi). *Environ. Urbanization* 30 (2), 597–612. <https://doi.org/10.1177/0956247818766495>.
- Hutton, G., Varughese, M., 2016. *The costs of meeting the 2030 sustainable development goal targets on drinking water, sanitation, and hygiene*. Summary Report. WSP. Washington DC.
- JMP (Joint Monitoring Programme), 2023. *Progress on Household Drinking Water, Sanitation and Hygiene. 2000-2022 Five Years into the SDGs*. UNICEF/WHO, Geneva. <https://data.unicef.org/>.
- JMP, 2021. *Progress on Household Drinking Water, Sanitation and Hygiene. 2000-2020 Five Years into the SDGs*. UNICEF/WHO, Geneva. <https://data.unicef.org/>.
- Joshi, D., Fawcett, B., Mannan, F., 2011. Health, hygiene and appropriate sanitation: experiences and perceptions of the urban poor. *Environ. Urbanization* 23 (1), 91–111. <https://doi.org/10.1177/0956247811398602>.
- Kohler, E., Tilley, S., Bieri, P., 2013. Sanitation in developing countries: a review through a gender lens. *J. Water, Sanit. Hyg. Dev.* 3, 298–314. <https://doi.org/10.2166/washdev.2013.090>.
- Kokko, S., Fischer, K., 2021. A practice approach to understanding the multilevel dynamics of sanitation innovation. *Technol. Soc.* 64 (1), 101522. <https://doi.org/10.1016/j.techsoc.2020.101522>.
- Lawhon, M., McCreary, T., 2023. *Enough! A Modest Political Ecology for an Uncertain Future*. Agenda Publishing, Limited, Newcastle upon Tyne.
- Lawhon, M., Nsangi Nakyagaba, G., Karpouzoglou, T., 2022. Towards a modest imaginary? Sanitation in kampala beyond the modern infrastructure ideal. *Urban Stud.* 60 (1), 146–165. <https://doi.org/10.1177/00420980211064519>.
- Lerebours, A., Scott, R., Sansom, K., Kayaga, S., 2021. Regulating sanitation services in sub-saharan Africa: an overview of the regulation of emptying and transport of faecal sludge in 20 cities and its implementation. *Util. Pol.* 73, 101315. <https://doi.org/10.1016/j.jup.2021.101315>.
- Lüthi, C., Willetts, J., Hoffmann, S., 2020. City-wide sanitation: the urban sustainability challenge. *Front. Environ. Sci.* 8, 1–4. <https://doi.org/10.3389/fenvs.2020.585418>.
- Mara, D., Drangert, J.O., Viet Anh, N., Tonderski, A., Gulyas, H., Tonderski, K., 2007. Selection of sustainable sanitation arrangements. *Water Pol.* 9 (3), 305–318. <https://doi.org/10.2166/wp.2007.009>.
- Mara, D., 2012. Sanitation: what's the real problem? *Water Pol.* 43 (2), 86–92. <https://doi.org/10.1111/j.1759-5436.2012.00311.x>.
- Mason, N., Oyaya, C., Boulououar, J., 2020. Reforming urban sanitation under decentralization: cross-country learning for Kenya and beyond. *Dev. Pol. Rev.* 38 (1), 42–63. <https://doi.org/10.1111/dpr.12408>.
- McFarlane, C., 2023. *Waste and the City: the Crisis of Sanitation and the Right to Citylife*. Verso Books, London, New York.
- McFarlane, C., Silver, J., 2017. The political city: 'seeing sanitation' and making the urban political in cape town. *Antipode* 49 (1), 125–148. <https://doi.org/10.1111/anti.12264>.
- McGranahan, G., 2015. Realizing the right to sanitation in deprived urban communities: meeting the challenges of collective action, coproduction, affordability, and housing tenure. *World Dev.* 68, 242–253. <https://doi.org/10.1016/j.worlddev.2014.12.008>.
- McGranahan, G., Mitlin, D., 2016. Learning from sustained success: how community-driven initiatives to improve urban sanitation can meet the challenges. *World Dev.* 87, 307–317. <https://doi.org/10.1016/j.worlddev.2016.06.019>.
- Ménard, C., 2018. Introduction: sanitation and wastewater. *Util. Pol.* 53 (42), 1–2. <https://doi.org/10.1016/j.jup.2018.05.001>.

- Mitlin, D., 2015. Will urban sanitation 'leave No one behind'? *Environ. Urbanization* 27 (2), 365–370. <https://doi.org/10.1177/0956247815604527>.
- Moreira, F.D., Rezende, S., Passos, F., 2021. On-street toilets for sanitation access in urban public spaces: a systematic review. *Util. Pol.* 70, 101186 <https://doi.org/10.1016/j.jup.2021.101186>.
- Moya, B., Sakrabani, R., Parker, A., 2019. Realizing the circular economy for sanitation: assessing enabling conditions and barriers to the commercialization of human excreta derived fertilizer in Haiti and Kenya. *Sustainability* 11, 11). <https://doi.org/10.3390/su11113154>.
- Muller, M., 2020. Have five decades of development engineering research improved sanitation in southern Africa? *J. Int. Dev.* 32 (1), 96–111. <https://doi.org/10.1002/jid.3452>.
- Muzioeva, H., Gumbo, T., Kavishe, N., Moyo, T., Musondaappison, I., 2022. Decentralized wastewater system practices in developing countries: a systematic review. *Util. Pol.* 79, 101442 <https://doi.org/10.1016/j.jup.2022.101442>.
- Nance, E., Ortolano, L., 2007. Community participation in urban sanitation: experiences in northeastern Brazil. *J. Plann. Educ. Res.* 26 (3), 284–300. <https://doi.org/10.1177/0739456X06295028>.
- North, D., 1991. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press, Cambridge.
- Noy, C., 2008. Sampling knowledge: the hermeneutics of snowball sampling in qualitative research. *Int. J. Soc. Res. Methodol.* 11 (4), 327–344. <https://doi.org/10.1080/13645570701401305>.
- O'Keefe, M., Lüthi, C., Tumwebaze, I.K., Tobias, R., 2015. Opportunities and limits to market-driven sanitation services: evidence from urban informal settlements in East Africa. *Environ. Urbanization* 27 (2), 421–440. <https://doi.org/10.1177/0956247815581758>.
- Oberg, A., 2019. Problematizing urban shit(ting): representing human waste as a problem. *Int. J. Urban Reg. Res.* 43, 377–392. <https://doi.org/10.1111/1468-2427.12744>.
- Öberg, G., Merlinsky, M.G., LaValle, A., Morales, M., Tobias, M.M., 2014. The notion of sewage as waste: a study of infrastructure change and institutional inertia in Buenos Aires, Argentina and Vancouver, Canada. *Ecol. Soc.* 19 (2) <https://doi.org/10.5751/ES-06531-190219>, 19.
- Panchang, V.S., 2021. Beyond toilet decisions: tracing sanitation journeys among women in informal housing in India. *Geoforum* 124, 10–19. <https://doi.org/10.1016/j.geoforum.2021.05.011>.
- Paterson, C., Mara, D., Curtis, T., 2007. Pro-poor sanitation technologies. *Geoforum* 38 (5), 901–907. <https://doi.org/10.1016/j.geoforum.2006.08.006>.
- Peprah, D., Baker, K.K., Moe, C., Robb, K., Wellington, N.I.L., Yakubu, H., Null, C., 2015. Public toilets and their customers in low-income Accra, Ghana. *Environ. Urbanization* 27 (2), 589–604. <https://doi.org/10.1177/0956247815595918>.
- Perard, E., 2018. Economic and financial aspects of the sanitation challenge: a practitioner approach. *Util. Pol.* 52, 22–26. <https://doi.org/10.1016/j.jup.2018.03.007>.
- Prabaharyaka, I., 2020. Shit, shit, every where (or: notes on the difficulties of classifying shits). *Int. Dev. Plann. Rev.* 42 (3), 295–313. <https://doi.org/10.3828/idpr.2020.12>.
- Rao, K.C., Otoo, M., Drechsel, P., Hanjra, M.A., 2017. Resource recovery and reuse as an incentive for a more viable sanitation service chain. *Water Altern.* 10 (2), 493–512. <https://hdl.handle.net/10568/83457>.
- Reymond, P., Wahaab, R.A., Moussa, M.S., Lüthi, C., 2018. Scaling up small scale wastewater treatment systems in low-and middle-income countries: an analysis of challenges and ways forward through the case of Egypt. *Util. Pol.* 52, 13–21. <https://doi.org/10.1016/j.jup.2018.03.008>.
- Rijkje-Epstein, T., 2019. The politics of filth: sanitation, work, and competing moralities in urban Madagascar 1890s-1977. *J. Afr. Hist.* 60 (2), 229–256. <https://doi.org/10.1017/S0021853719000483>.
- Robins, S., 2014. The 2011 toilet wars in South Africa: justice and transition between the exceptional and the everyday after apartheid. *Dev. Change* 45 (3), 479–501. <https://doi.org/10.1111/dech.12091>.
- Rodriguez, D.J., Serrano, H.A., Delgado, A., Nolasco, D., Saltiel, G., 2020. *From Waste to Resource: Shifting Paradigms for Smarter Wastewater Interventions in Latin America and the Caribbean*, World Bank (The), GWSP, PPIAF. Worldbank.org, Washington DC.
- Rosenquist, L.E.D., 2005. A psychosocial analysis of the human-sanitation nexus. *J. Environ. Psychol.* 25 (3), 335–346. <https://doi.org/10.1016/j.jenvp.2005.07.003>.
- Rosenqvist, T., Mitchell, C., Willetts, J., 2016. A short history of how we think and talk about sanitation services and why it matters. *J. Water, Sanit. Hyg. Dev.* 6 (2), 298–312. <https://doi.org/10.2166/washdev.2016.118>.
- Sabbioni, G., 2008. Efficiency in the Brazilian sanitation sector. *Util. Pol.* 16 (1), 11–20. <https://doi.org/10.1016/j.jup.2007.06.003>.
- Saiani, C., de Azevedo, P.F., 2018. Is privatization of sanitation services good for health? *Util. Pol.* 52, 27–36. <https://doi.org/10.1016/j.jup.2018.03.003>.
- Satterthwaite, D., Mitlin, D., Bartlett, S., 2015a. Is it possible to reach low-income urban dwellers with good-quality sanitation? *Environ. Urbanization* 27 (1), 3–18. <https://doi.org/10.1177/0956247815576286>.
- Satterthwaite, D., Mitlin, D., Bartlett, S., 2015b. Key sanitation issues : commitments, coverage, choice, context, Co-production, costs, capital, city-wide coverage. *Environment and Urbanization briefs* 31 (4), 1–6 pubs.iied.org/pdfs/10745IIED.pdf.
- Schramm, S., 2016. Flooding the sanitary city: planning discourse and the materiality of urban sanitation in hanoi. *City* 20 (1), 32–51. <https://doi.org/10.1080/13604813.2015.1125717>.
- Scott, W.R., 1995. *Institutions and Organizations*. Sage Publications, Thousand Oaks.
- Scott, P., Cotton, A., 2020. The sanitation cityscape – toward a conceptual framework for integrated and citywide urban sanitation. *Front. Environ. Sci.* 8, 1–9. <https://doi.org/10.3389/fenvs.2020.00070>.
- Scott, P., Cotton, A., Sohail, M., 2015. Using tenure to build a 'sanitation cityscape': narrowing decisions for targeted sanitation interventions. *Environ. Urbanization* 27 (2), 389–406. <https://doi.org/10.1177/0956247815569415>.
- Seroa da Motta, R., Moreira, A., 2006. Efficiency and regulation in the sanitation sector in Brazil. *Util. Pol.* 14 (3), 185–195. <https://doi.org/10.1016/j.jup.2006.03.002>.
- Silveti, D., Andersson, K., 2019. Challenges of governing off-grid 'productive' sanitation in peri-urban areas: comparison of case studies in Bolivia and South Africa. *Sustainability* 11 (12), 3468. <https://doi.org/10.3390/su11123468>.
- Simiyu, S., 2016. Determinants of usage of communal sanitation facilities in informal settlements of kisumu, Kenya. *Environ. Urbanization* 28 (1), 241–258. <https://doi.org/10.1177/0956247815616732>.
- Sinharoy, S., Pittluck, R., Clasen, T., 2019. Review of drivers and barriers of water and sanitation policies for urban informal settlements in low-income and middle-income countries. *Util. Pol.* 60, 100957 <https://doi.org/10.1016/j.jup.2019.100957>.
- Spronk, S., 2009. Making the poor work for their services: neo-liberalism and 'pro-poor' privatization in El Alto, Bolivia. *Can. J. Dev. Stud.* 28 (3–4), 397–413. <https://doi.org/10.1080/02255189.2009.9669221>.
- Swanson, M., 1977. The sanitation syndrome: bubonic plague and urban native policy in the cape colony, 1900-1909. *J. Afr. Hist.* 18 (3), 387–410. <http://www.jstor.com/stable/180639>.
- Tomlinson, R., 2015. Scalable community-led slum upgrading: the Indian alliance and community toilet blocks in Pune and Mumbai. *Habitat Int.* 50, 160–168. <https://doi.org/10.1016/j.habitatint.2015.08.020>.
- Truffer, B., 2022. *New perspectives on sustainable sanitation. Insights from socio-technical innovation and transition studies*. In: Colon, M., Rieu, T. (Eds.), *Overcoming Institutional and Organisational Barriers to Sanitation: What's New?* French Development Agency, Paris, pp. 9–12. Technical paper.
- Tumwebaze, I.K., Niwagaba, C.B., Günther, I., Mosler, H.J., 2014. Determinants of households' cleaning intention for shared toilets: case of 50 slums in kampala, Uganda. *Habitat Int.* 41, 108–113. <https://doi.org/10.1016/j.habitatint.2013.07.008>.
- Tumwebaze, I.K., Orach, C.G., Niwagaba, C., Luthi, C., Mosler, H.J., 2013. Sanitation facilities in Kampala slums, Uganda: users' satisfaction and determinant factors. *Int. J. Environ. Health Res.* 23 (3), 191–204. <https://doi.org/10.1080/09603123.2012.713095>.
- UN (the), 2022. *The Sustainable Development Goals Report 2022*. United Nations. <https://unstats.un.org/sdgs/report/2022/>.
- UN-Water, 2018. *Nature-Based Solutions for Water Management: A Primer*. UN Environment, DHI. IUCN. <https://wedocs.unep.org/20.500.11822/32058>.
- Valette, H., Colon, M., 2022. Institutional change in the sanitation sector from the human and social sciences viewpoint. In: Colon, M., Rieu, T. (Eds.), *Overcoming Institutional and Organisational Barriers to Sanitation: What's New?* Technical Paper. French Development Agency, Paris, pp. 45–48. <https://www.afd.fr/en/rt-68-va-barriers-to-sanitation-colon-rieu-botton-gaudry>.
- Vélez-Ramírez, A., Rivera-Castañeda, P., Muñoz-Pizza, D.M., 2022. Institutional capacity determinants in a Global South city: the case of a wastewater utility in zacatecas, Mexico. *Util. Pol.* 79, 101453 <https://doi.org/10.1016/j.jup.2022.101453>.
- Venkataramanan, V., Crocker, J., Karon, A., Bartram, J., 2018. Community-led total sanitation: a mixed-methods systematic review of evidence and its quality. *Environ. Health Perspect.* 126, 2. <https://doi.org/10.1289/EHP1965>.
- Van Vliet, B., Spaargaren, G., Oosterveer, P. (Eds.), 2010. *Social Perspectives on the Sanitation Challenge Social Perspectives on the Sanitation Challenge*. Springer, Dordrecht Heidelberg London New York.
- Van Vliet, B., Spaargaren, G., Oosterveer, P., 2011. Sanitation under challenge : contributions from the social sciences. *Water Pol.* 13 (6), 797–809. <https://doi.org/10.2166/wp.2011.089>.
- Van Welie, M.J., Boon, W.P.C., Truffer, B., 2020. Innovation system formation in international development cooperation: the role of intermediaries in urban sanitation. *Sci. Publ. Pol.* 47 (3), 333–347. <https://doi.org/10.1093/scipol/scaa015>.
- Van Welie, M.J., Romijn, H.A., 2018. NGOs fostering transitions towards sustainable urban sanitation in low-income countries: insights from transition management and development studies. *Environ. Sci. Pol.* 84, 250–260. <https://doi.org/10.1016/j.envsci.2017.08.011>.
- Weststrate, J., Gianoli, A., Eshuis, J., Dijkstra, G., Cossa, I.J., Rusca, M., 2019. The regulation of onsite sanitation in Maputo, Mozambique. *Util. Pol.* 61, 100968 <https://doi.org/10.1016/j.jup.2019.100968>.
- Whittington, D., Radin, M., Jeuland, M., 2020. Evidence-based policy analysis? The strange case of the randomized controlled trials of community-led total sanitation. *Oxf. Rev. Econ. Pol.* 36 (1), 191–221. <https://doi.org/10.1093/oxrep/grz029>.
- World Bank (the), ILO, Wateraid, WHO, 2019. *Health, safety and dignity of sanitation workers health, safety and dignity of sanitation workers*, Washington DC. Health, safety and dignity of sanitation workers.
- WSP, 2011. *The political economy of sanitation: how can we increase investment and improve service for the poor?* Report. Washington DC. <http://hdl.handle.net/10986/17276>.
- Xess, S.C., Zérah, M.H., 2017. *Working in tandem. The Informal Septic Tank Emptying Market in Aya Nagar*. Center for Policy Research. CPR (cprindia.org), Delhi.
- Zaqout, M., Cawood, S., Evans, B.E., Barrington, D.J., 2020. Sustainable sanitation jobs: prospects for enhancing the livelihoods of pit-emptiers in Bangladesh. *Third World Q.* 42 (2), 329–347. <https://doi.org/10.1080/01436597.2020.1810560>.
- Zhang, H., Friedman, E., 2019. Informality and working conditions in China's sanitation sector. *China Q.* 238, 375–395. <https://doi.org/10.1017/S0305741018001388>.