Policy Diffusion in the Rural Sanitation Sector: Lessons from Community-Led Total Sanitation (CLTS)

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ABSTRACT

Worldwide, 892 million people practice open defecation, most of whom live in rural areas of South Asia and Sub-Saharan Africa (UNICEF & WHO, 2017). Over the past twenty years, economic progress, along with the efforts of development organizations and national governments, has substantially reduced open defecation in many regions of the developing world. Between 2000 and 2015, open defecation decreased from 42% to 32% in rural Sub-Saharan Africa, from 68% to 43% in Central and Southern Asia, and from 29% to 11% in Latin America (UNICEF & WHO, 2017). Nonetheless, sanitation coverage increases must accelerate to meet the Sustainable Development Goal (SDG) for sanitation, which calls for ending open defecation and achieving universal access to adequate and equitable sanitation (UN Water, 2019).

Meanwhile, sustaining rural sanitation improvements has been challenging for a number of reasons. In general, the financial resources dedicated to rural sanitation are woefully inadequate; only very modest fractions of developing countries’ GDPs are allocated to water, sanitation and hygiene (WASH), and of these amounts, little is spent on sanitation or rural development (World Health Organization, 2010, 2017). Lack of political commitment at multiple levels, fragmented and/or dysfunctional institutional arrangements, un-implemented policies or strategies, and lack of access to affordable sanitation products and services, are other constraints on the sustainable growth of sanitation coverage.

Perhaps most notably, rural household demand for improved sanitation has historically been low (Jenkins & Sugden, 2006; O’Reilly & Louis, 2014). In many regions, efforts to construct latrines in rural areas have failed because local people have appeared not to value, use or maintain facilities. Non-market supply-driven approaches (in which governments or non-governmental organizations (NGOs) have constructed toilets with no involvement – financial or otherwise – from beneficiaries) have also been blamed for creating a “dependency syndrome” that runs counter to

1. Introduction

Worldwide, 892 million people practice open defecation, most of whom live in rural areas of South Asia and Sub-Saharan Africa (UNICEF & WHO, 2017). Over the past twenty years, economic progress, along with the efforts of development organizations and national governments, has substantially reduced open defecation in many regions of the developing world. Between 2000 and 2015, open defecation decreased from 42% to 32% in rural Sub-Saharan Africa, from 68% to 43% in Central and Southern Asia, and from 29% to 11% in Latin America (UNICEF & WHO, 2017). Nonetheless, sanitation coverage increases must accelerate to meet the Sustainable Development Goal (SDG) for sanitation, which calls for ending open defecation and achieving universal access to adequate and equitable sanitation (UN Water, 2019).
the ideal of community self-help (Kar & Pasteur, 2005). For these reasons, the past two decades have witnessed an increased focus on behavioral approaches meant to stimulate demand for – and use of – sanitation facilities (Jenkins & Sugden, 2006; Venkataramanan, 2017).

Community-Led Total Sanitation (CLTS) is one of the most widely deployed of these behavioral interventions, representing a paradigm shift from previous top-down, subsidy-driven approaches. Rather than directly delivering hardware or prescribing particular designs that may not be locally sensible, CLTS relies on behavioral change and community self-enforcement to end open defecation and prompt the construction of latrines, often with locally available materials and know-how.

Since its genesis in Bangladesh in 1999, CLTS has spread worldwide and is now implemented at least at some scale in 59 countries in Asia, Africa, and Latin America (Fig. 1). Among these, 31 countries have adopted CLTS as part of their official national strategy or policy for rural sanitation (IDS, 2019b). Although the widespread diffusion of policy models is certainly not new, the pace at which policies and ideas tend to circulate globally has increased dramatically over the last decade (Montero, 2018). The rapid diffusion of the CLTS approach, as well as the likelihood that behavioral interventions, and in particular disgust-based interventions like CLTS, will continue to be implemented across the Global South (Brevis et al., 2019), calls for an improved understanding of the reasons for its global spread.

The mechanisms of policy diffusion have been documented in the sectors of transportation (Montero, 2017b, 2017c), irrigation (Molle & Berkoff, 2007; Rap, 2006; Rap & Wester, 2013; Venot, 2016), and urban planning (Cook & Ward, 2012b; González, 2011; McCann, 2011; McCann & Ward, 2012; Ward, 2018). By contrast we are aware of no studies on the diffusion of sanitation policies. The diffusion of CLTS is particularly interesting because unlike most documented policy diffusions, which took place between cities of the global North or travelled from the global North to the global South (Ward, 2018), CLTS is an innovation that spread “South to South,” albeit with donor support from the global North.

This paper adds to the body of literature on policy mobility and policy diffusion (McCann & Ward, 2012, 2013; Meinenz-Dick, 2007; Rap, 2006) by focusing on a specific sanitation policy and attempting to answer the following question: why and how did CLTS diffuse so extensively? We attempt to answer this question via a qualitative approach, relying principally on the analysis of policy documents, conference proceedings, and key informant interviews.

Policy diffusion takes place through multiple, often complementary mechanisms at both global and local scale (McCann & Ward, 2013; Montero, 2017a, 2017b). Molle (2008) coins as “snowballing” the “process through which a concept is gradually adopted by a growing number of dispersed actors, projected in professional events, circulated in academic literature, and gradually established as a consensual and controlling idea,” following “a big initial push.”

This initial push can occur through a number of “transfer agents” (Stone, 1999, 2004) who move a policy from one setting to another, and who are described as “not rational” but instead embedded members of epistemic communities (Cook & Ward, 2012a; pg. 140). Among transfer agents is the so-called “persuasive practitioner” (Montero, 2017a; pg. 66), an expert “constantly on the move,” champion of a given policy model, who “does not rely on technical or scientific expertise to legitimize herself. Instead, her legitimacy lies on her participation in the implementation of the policy.” Other important transfer agents include knowledge intermediaries, particularly consultants: while in the past, policies were moved mostly by professional employees such as architects, engineers, and planners, external consultants are now playing an increasingly important role (Ward, 2018).

Although improvements in technology have made it much easier to learn about policy innovations from a distance, face-to-face interactions remain essential to give policy makers opportunities to compare, evaluate, learn, and judge sanitation policies in their country with others. Conferences in particular have been identified as facilitating policy spread (Cook & Ward, 2012a; McCann, 2011). Face-to-face communication is believed to play a particularly important role when rapid feedback is needed and information is not easily transmitted in other ways, as well as to build trust and collaborations among different actors (Montero, 2017a).

Experiential learning, and in particular, study tours, are a well-recognized practice to facilitate policy adoption across spaces. Study tours are short visits of a delegation to one or multiple locations in a site, in this case rural communities, to experience the potential of a policy or an approach. Their importance is believed to go well beyond exposure of participants to new policy ideas into the expansion of local coalitions through the creation of trust-based relationship and consensus around a given policy approach, and even mobilization of public opinion to support its adoption and implementation (Montero, 2017b).

We argue that despite the lack of robust evidence on CLTS’s effectiveness, the attractive characteristics of the approach, combined with timing and governments’ absorptive capacity, facilitated its diffusion. In line with the policy mobility literature on how and why policies diffuse (Cook & Ward, 2011; McCann, 2011; McCann & Ward, 2012, 2013; Ward, 2018), we find that influential development organizations, a persuasive practitioner supported by donors (Kamal Kar2), and a network of champions at the local and global level, played a major role in enhancing the appeal of CLTS and facilitating its adoption as a policy. Conferences (Cook & Ward, 2012a; Ward, 2018), study tours (Montero, 2017b), and regional workshops created opportunities for face-to-face interactions and experiential learning, which facilitated the spread of the approach. Finally, we discuss the role of different types of evidence in the spread of the approach.

This paper is organized in the following manner. Section 2 describes the CLTS approach. Section 3 presents the methods. Section 4 discusses the reasons why CLTS was adopted globally. Section 5 examines the mechanisms underlying the adoption process and the role of evidence. Section 6 concludes and discusses possible ways in which the rural sanitation sector can better integrate evidence into policy-making.

2. What is CLTS?

CLTS leverages emotional drivers such as disgust, fear, shame, pride, and dignity to mobilize communities to stop open defecation and build their own toilet facilities (Kar & Chambers, 2008). Trained facilitators convene a community meeting – a “triggering” event – at which open defecation is equated with eating each other’s excreta. Triggering includes a variety of activities, among them the participatory village mapping of open defecation spots, a “transect walk” through the community to locate open excreta, a calculation of the volume of feces generated by the community, and a demonstration of fecal-oral contamination pathways (such

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1 An epistemic community may consist of knowledge based experts such as academics, decision-makers and other professionals from different disciplines who share a set of normative and principled beliefs, play a role in identifying the cause-and-effect relationships of complex problems, frame issues for collective debate and propose specific policies (Itoz, 1992).

2 Dr. Kamal Kar invented the CLTS approach in 1999 in Bangladesh. His role is more extensively described in section 5.1.
as the placement of a plate of food near feces until flies start traveling between the two (Kar & Chambers, 2008). At the end of a strategy or through large NGO programs (based on IDS, 2019a; USAID, 2018). The black symbol indicates countries where CLTS has been implemented at large scale either as part of the national strategy or through large NGO programs (based on IDS, 2019a; USAID, 2018).

Fig. 1. Map of countries where CLTS has been introduced. Colors indicate the years in which CLTS was first piloted in the country. Sources: (Balfour, Otieno, Mutai, & Thomas, 2014; Galbraith & Thomas, 2009; IDS, 2019a; Kar, 2010; Kar & Chambers, 2008; Kar & Milward, 2011; Kar & Pasteur, 2005; Mehta, 2009; Protos., 2016; UNICEF, 2015; UNICEF WCARO, 2011; Venkataramanan & Shannon, 2015). The black symbol indicates countries where CLTS has been implemented at large scale either as part of the national strategy or through large NGO programs (based on IDS, 2019a; USAID, 2018).

While CLTS has been introduced in 59 countries, rollout has not been uniform among them (Fig. 1). For example, all regions in Senegal, 90% of the regions in Ghana, and 90% of the provinces in Zambia are reported to be employing the approach, compared to only 40% in Côte d’Ivoire and 20% in the Philippines (USAID, 2018). CLTS has been largely funded by international donors such as the Global Sanitation Fund (GSF) of the Water Supply & Sanitation Collaborative Council (WSSCC), the World Bank, the United Kingdom’s Department for International Development (DFID), the United States Agency for International Development (USAID), the Bill and Melinda Gates Foundation, the Netherlands’ Directorate-General for International Cooperation (DGIS), and the European Union (EU). Donor funds are typically allocated to an executing entity, which can be either an international NGO (e.g., SNV, Plan International, Global Communities), UNICEF, or a national government (as is the case in Ethiopia and Uganda) (Deak, 2008; Global Sanitation Fund, 2016; Venkataramanan & Shannon, 2016). The executing entity in turn coordinates implementation either through decentralized government structures, local NGOs, or both.

Implementation structures vary considerably both among and within countries. It is not uncommon for multiple CLTS programs to be in place within a given country or even a single district, funded by different donors and implemented through disparate institutional arrangements. Table 1 illustrates the multiplicity of implementation arrangements in Cambodia and Ghana.

Although most CLTS programs adhere to the same key principles (reliance on emotional drivers, focus on locally-available capacity and materials, etc.) (Kar & Chambers, 2008), the diversity of contexts and implementation structures leads to considerable variability in program implementation; in the words of one of our key informants, “there is not one CLTS, there is no monolithic [...] or standardized way of doing it. There are many versions of CLTS, some good and some bad.” This is not surprising, as innovations may evolve spatially and temporally when diffusing through different locations and institutions (McCann & Ward, 2013). Elements that differ across contexts include triggering activities, the frequency and intensity of follow-up visits, the degree of technical guidance provided to communities, and recruitment and training of community volunteers to spearhead collective action (Harter & Mosler, 2018; Sigler, Mahmoudi, & Graham, 2015; Venkataramanan, 2012; Venkataramanan & Shannon, 2016).

3. Methods

In line with policy mobility authors’ call for a multi-sited qualitative and ethnographic method (McCann, 2011; McCann & Ward, 2012, 2013; Montero, 2017b; Ward, 2018), we rely on different types of evidence from multiple countries over a period of 20 years, between 1999 and 2019. We reviewed over 200 documents about CLTS and rural sanitation programs, including peer-reviewed articles, program reports and evaluations, national strategies and policies, historical and practical documents written by CLTS advocates, and best-practice repositories published by the Institute for Development Studies’ (IDS) CLTS Knowledge Hub3. We also reviewed the proceedings of CLTS events organized as part of the ministerial conferences on sanitation in Africa and Asia, and of the regional workshops organized by the CLTS Knowledge Hub. Some of the analysis presented here expands upon that featured by USAID (2018). Most documents were found through online searches, backward and forward reference searching, and backward and forward author searching; other documents were provided directly by sector practitioners.

To supplement our review of the literature, we conducted 30 interviews with key informants: sector experts, present and former sanitation program managers, and district-level personnel involved in day-to-day CLTS operations from 14 countries (Bangladesh, Cambodia, Ethiopia, Ghana, Indonesia, Kenya, Lao, Mali, Mozambique, Nigeria, Senegal, Tanzania, Uganda, Zambia). We also interviewed nine experts from donor institutions, implementing organizations, and researchers based in the UK, USA, Canada, and others.

3 The CLTS Knowledge Hub is a donor-funded organization that “is dedicated to supporting the scaling up of inclusive CLTS and rural sanitation approaches with quality and sustainability through timely, rapid and adaptive sharing and learning. [The Hub] seeks to add to the energy and momentum behind CLTS” (IDS, 2019a).
Switzerland, and France. These interviewees were selected purposively because of the role either they or their organization played in the design and implementation of CLTS in one or more countries. Two of us [CD and JA] attended regional knowledge-sharing workshops organized by the CLTS Knowledge Hub in the Philippines, Tanzania, and Senegal, which, in total, brought together several dozen experienced CLTS practitioners and managers from across South-East Asia and Africa. One of us [VZ] attended the African Conference on Sanitation (AfricaSAN) in Cape Town in 2019, and five of us [CD, VZ, JA, RP, RK] attended the yearly conference at the University of North Carolina – Chapel Hill multiple times. Finally, two of us [RK and CD] attended the World Water Week in 2018. Attending these conferences allowed us to better understand the role of face-to-face interactions and the type of evidence used in the rural sanitation sector.

### 4. Why did CLTS diffuse?

#### 4.1. The attractive characteristics of CLTS

CLTS has several characteristics that make it an attractive innovation for adoption and diffusion. First, it was perceived to deliver tangible results quickly (Ahmed, 2008; Chambers, 2009; Mukherjee & Shatifan, 2008). According to Robert Chambers of the Institute for Development Studies, a scholar of participatory rural appraisal techniques who has long played a key role in promoting the approach, “the speed of going total, meaning that the community is claiming to be ODF, can be remarkable. In best-case scenarios communities declare themselves or are declared ODF in a matter of weeks. Where triggering is successful, there is typically a sudden acceleration of activity” (Chambers, 2009; pg. 15). The perceived speed with which results could be achieved was all the more appealing as the sector at the time was — according to one interviewee — “desperate” for solutions to improve rural sanitation and was feeling “hopeless.” In the words of another key informant, CLTS was seen as “the new game in town” and as a “disruptive technology” providing “dramatic, immediate results.” Many key informants reported that in the 2000s, CLTS was hailed as a sanitation magic bullet.

Donors, implementing agencies, and governments saw CLTS as both a practical and attractive way to reduce government responsibility and public expenditure for sanitation service delivery while increasing the involvement of communities (Ackerman, 2004; Joshi & Moore, 2004; Kar & Pasteur, 2005). While previous approaches to rural sanitation tended to rely predominantly on direct government involvement to subsidize and build toilets, CLTS was perceived to be simpler, cheaper, and easier to scale up. The CLTS narrative implied that minimal effort and institutional change was necessary to successfully implement the approach (Ficek & Novotný, 2018; Brewis et al., 2019 and key informants). According to one key informant, “it appeared that you did not have to build whole new structures to be able to make it happen. You could have

Kamal Kar come into a country, fly in and go out to a couple of communities literally the day after he arrived and trigger them with people watching...You didn't need to establish a new industry in order to make the approach work.” Furthermore, because the main CLTS input is facilitation during triggering and follow-up (with communities responsible for building their own latrines), it was “perceived as an approach that does not cost anything”, “a way to get rapid OD results without having to pump a bunch of public money into the sector,” and a way to “spend less to achieve more” (Chambers, 2009; pg. 13). CLTS’s focus on communal rather than individual behavior change, targeting all members – rather than just a subset – of a community, appealed to donors and governments alike (Kumar & Shukla, 2010).

In addition, CLTS’s emphasis on behavior change was seen as key to overcoming one of the main challenges faced by previous sanitation approaches: low use of latrines by beneficiaries (Cairncross, 2004; Mara, Lane, Scott, & Trouba, 2010; Mosler, 2012; Peal, Evans, & Van der Voorden, 2010; Rusca, Schwartz, Hadzovic, & Ahlers, 2015; Stanton, Black, Engle, & Pelto, 1992). Moving away from health messaging, CLTS focused on creating demand for sanitation using alternative emotional drivers: disgust, pride, shock, and shame. As one CLTS implementer explained: “we are not teaching, we are not educating. We are changing people’s minds.”

Finally, CLTS must be understood in the context of the wider development discourse that has come to favor decentralized service provision and increased community participation (Jiménez et al., 2019). Involving communities in development interventions has been embraced enthusiastically as a way to empower people while being consistent with the decentralization paradigm (Cornwall & Brock, 2005; Mukherjee & Shatifan, 2008; Rusca et al., 2015). While attention to community participation existed in the previous Millennium Development Goal (MDG) era, it became a focus of the 2030 Agenda for Sustainable Development, which in Sustainable Development Goal (SDG) Target 6.B includes the explicit call to “support and strengthen the participation of local communities in improving water and sanitation management” (UN Water, 2019).

The above characteristics of CLTS are fundamental to understand why this approach was embraced over other policies, and particularly over the best-known policy alternative at the time, Participatory Hygiene and Sanitation Transformation (PHAST) (Movik & Mehta, 2011). Like CLTS, PHAST is a community-based behavior change approach, but in contrast to CLTS, it targets a subgroup of a community (like the poor), is not exclusively focused on sanitation, and relies on hygiene and health messages and an educational approach (Venkateswaran, Hueso, Yamakoshi, Stricker, Gnilo, & Coultas, 2018). Further, PHAST considers rural households as “beneficiaries,” which conflicted with the paradigm of community participation and empowerment. According to Movik and Mehta (2011), who cite Waterkeyn and Cairncross (2005), “PHAST remained largely an interesting concept rather than an applied program and by 2001 the regional planners [...] were losing interest.”

### Table 1

Main CLTS implementation structures in Cambodia and Ghana illustrating various degrees of stratification and government involvement.

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<th>Cambodia</th>
<th>Ghana</th>
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<tr>
<td><strong>Donor</strong></td>
<td>Global Sanitation Fund</td>
<td>DGB; Global Affairs Canada</td>
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<td><strong>Executing Agency</strong></td>
<td>Plan International</td>
<td>World Bank</td>
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<td><strong>Implementing organizations</strong></td>
<td>11 local NGOs</td>
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<td>Local government</td>
<td>Global Communities</td>
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Acronyms: CWSA: Community Water and Sanitation Agency (government institution).
arily, a key informant explained that PHAST had been around for a long time, and “never had a champion, and never managed to produce the kind of momentum that CLTS had.” Such thinking was reiterated in Kar and Milward (2011), where PHAST was described as not particularly effective at the time when donors were looking for solutions. The more limited uptake of PHAST may also owe to its focus on health risks, which was perceived as less compelling than the themes of disgust, self-respect and convenience used in CLTS (Greaves, 2012).

4.2. Timing

Timing plays an important role in the adoption of policy innovation (Reich, 1995). CLTS diffused at a time when practitioners and policymakers were looking for new ways of increasing sanitation coverage to meet the MDGs, and gained momentum when it became apparent that the MDG sanitation target was not likely to be met (JMP, 2008).

Beginning in the early 2000s, government officials responsible for sanitation and hygiene started meeting regularly at the African Conference on Sanitation (AfricaSan) and South Asian Conference on Sanitation (SACOSAN) as sanitation gained increased attention in national political agendas. In 2008, the WHO/UNICEF Joint Monitoring Program published for the first time statistics on open defecation disaggregated from other unimproved sanitation access (JMP, 2008). As explained by one of the key informants familiar with the preparation of this 2008 report, “until then people had known sanitation was bad, but it wasn’t until people started looking at the incredibly high open defecation numbers that they began to realize how bad it was. It wasn’t that these people had bad sanitation; they had no sanitation.” These statistics acted as a catalyst for action in some countries (key informant interview). Two-thousand eight was declared the International Year of Sanitation (IYS) by the United Nations General Assembly, which increased political will and specifically “[encouraged] demand-driven, sustainable and traditional solutions, and informed choices by recognizing the importance of working from the bottom up with communities and practitioners” (UNICEF, 2008). CLTS was first introduced between 2008 and 2010 in over half (30/59) of the countries where it has been implemented (Fig. 2).

The spread of CLTS was also aided by an increase in sanitation funding. Official development assistance for basic sanitation tripled between 2010 and 2015, from USD 38 million in 2010 to USD 141 million in 2015 (OECD, n.d.). This increase was particularly important for the adoption of CLTS in countries with limited (if any) domestic funds to implement rural sanitation programs, as was often the case in Africa (key informant interviews).

4.3. Governments of many countries had “absorptive capacity”

When CLTS began to spread in the mid to late 2000s, many governments either did not have a rural sanitation strategy in place, or did not have one that could be implemented effectively at scale. In a survey of 69 countries conducted before the start of the IYS in 2008, UNICEF (2008) found that 38% of the countries had no policy or strategy to reach the MDG for sanitation. As one of our key informants explained, “we came out of a generation for whom sanitation was always thought of as an afterthought to water. You designed a water-supply program and then you did a little bit of sanitation as an afterthought, and CLTS was the way to break this thinking about sanitation as a hopeless lost cause.” As a result, many governments and donors were looking for a paradigm shift to jump-start their country’s sanitation activities. One of our informants from Mali explained: “before CLTS, rural sanitation was not more than pilots or subsidized latrines. [The] Mali government adopted CLTS [in 2009] and now we have a clear vision for rural sanitation. Today we have more than 3000 villages that are ODF, there is great consensus around CLTS in the country, and the approach is well organized.”

Adoption was particularly rapid in countries where rural sanitation policies did not exist (e.g., Ethiopia and Mali) or where CLTS could be easily incorporated into an existing sanitation program (e.g., World Bank project in Indonesia) (Kar & Milward, 2011). By contrast, where sanitation policies were in place and/or already implemented (e.g., Bangladesh, Cambodia, and India), CLTS was only complementary to other approaches that may have been partly inconsistent with CLTS principles (e.g., sanitation subsidies) and its uptake was slower or less successful (Kar & Milward, 2011).

4.4. Exceptions

Our analysis of CLTS diffusion would not be complete without reflecting on the far lower adoption of the approach in most of India, Latin America, and the Caribbean. In contrast with most countries, which either did not have a sanitation strategy in place or had a policy that could not be implemented at scale in the mid to late 2000s, when CLTS spread, India had had a national policy since 1986, which was then revamped in 1999 into the Total Sanitation Campaign (TSC). While TSC had a component aimed at increasing awareness and demand, its strong subsidy orientation made it difficult to reconcile with CLTS, with the exception of few states (Kumar & Shukla, 2010). In addition, some experts have proposed that the culture of caste and untouchability has resulted in a “revealed preference for open defecation” over inexpensive latrines (Coffey et al., 2014, 2015), which may further explain why Indian policy makers have not adopted CLTS as national policy. Because rural Indians may identify more closely with their caste and religious groups than with their communities, CLTS might not be the most appropriate approach in this context (Hathi, Spears, & Coffey, 2016). In Latin America and the Caribbean, it has only been implemented in three countries: Bolivia, Guatemala, and Haiti (IDS, 2019a). In Bolivia, CLTS was introduced by UNICEF in 2009 and has been implemented in partnership with the government, partly in combination with subsidies (UNICEF Bolivia, 2019). In Guatemala, CLTS was only introduced in 2016 and only spread to a limited extent; in Haiti, CLTS has been introduced in 2011, but implementation has been challenging due to entrenched household expectations of external support (Plan International & UNC Water Institute, 2016). In Latin America and the Caribbean, limited adoption of CLTS may be attributable to a lower sense of urgency: according to the first available data that disaggregates open defecation rates by country (JMP, 2008), rural open defecation rates in 2006 were considerably lower in Latin America (23%) than in

Fig. 2. Cumulative number of countries where CLTS has been introduced from 1999 to 2015 (N = 59). Sources: (Balbou et al., 2014; Galbraith & Thomas, 2009; IDS, 2019a; Kar, 2010; Kar & Chambers, 2008; Kar & Milward, 2011; Kar & Pasteur, 2005; Mehta, 2009; Protos, 2016; UNICEF, 2015; UNICEF WCARO, 2011; Venkataramanan & Shannon, 2015).

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South Asia (63%) or Sub-Saharan Africa (39%). Latin America is also less dependent on donor funding for its water and sanitation sector than Africa or South Asia (World Health Organization, 2017), and national policies are thus subject to less influence from donors. Finally, lack of geographical proximity to the regions that experienced fast uptake may be a factor. Diffusion of innovation theory recognizes geographical proximity as a key driver in knowledge diffusion (Rogers, 2003).

5. How did CLTS diffuse?

The process of snowballing introduced by Molle (2008) is well suited to describe the diffusion of CLTS. The snowballing of CLTS was first initiated by influential donors and NGOs, and continued through in-person trainings by Kamal Kar, networks of consultants and academics meeting at conferences, and experiential learning events. This section further describes these mechanisms.

5.1. The role of a persuasive practitioner and influential development organizations

In line with prior literature emphasizing the role of persuasive practitioners in the diffusion of policies (Montero, 2017a), the CLTS approach was championed by Kamal Kar, who is widely credited with conceiving CLTS in 1995 as a consultant to WaterAid in Bangladesh and who played a key role in the spread of the approach worldwide. Kar himself wrote that “CLTS was new and my role was to run workshops which could present the evidence that CLTS works, convince and persuade key actors” (Kar & Milward, 2011; pg. 26). Like persuasive practitioners in other contexts (Montero, 2017a), Kar used emotional narratives and visual cues to persuade audiences that CLTS eliminates open defecation. For example, in a WHO conference in 2010 (cited in Bardosh, 2015), Kar remarked that “in today’s world more people have access to mobile phones than to sanitation...this is crazy! We need to start talking about shit in the open...people do not want to be eating each other’s shit. CLTS empowers them to do this...people can take sanitation into their own hands. I have seen it.” Kar was nominated as one of the 100 top thinkers in the world by the journal Foreign Policy in 2010 (Swift, 2010).

Contracted by the lead organizations (UNICEF, World Bank, Plan International, etc.) starting from 2001, Kar personally delivered trainings to government and NGO staff in at least 35 countries and was indirectly involved in introducing CLTS in at least fifteen others (CLTS Foundation, 2013) (Fig. 3). While CLTS was eventually championed by NGOs and donors, these organizations initially had to change the way they did sanitation programming, and sometimes faced internal resistance that Kar played an important role in overcoming. For example, one key informant explained that many WASH engineers working in donor agencies were reluctant to give up subsidies and became convinced to use a more demand-driven approach to sanitation only after Kar’s training and workshops. Kar has been a keynote speaker at many important global sanitation events and forums, including SACOSAN, AfricaSan, East Asia Sanitation Conference (EASAN), Global Sanitation Forum, World Water Week and World Water forums (Kamal Kar, n.d.). He continues to be a well-known figure on the international WASH stage, and in contrast to other persuasive practitioners, such as politicians (Montero, 2017a), Kar has also collaborated with a number of academic institutions, including the Institute of Development Studies (UK), IHE Delft (Netherlands) and the Institute of Water Policy at the Lee Kuan Yew School of Public Policy, at the National University of Singapore. In his capacity as adjunct faculty member or fellow, he has developed course material for sanitation professionals and policy makers and endorsed CLTS in the academic arena.

While Kar played a fundamental role in persuading different types of stakeholders of the effectiveness of the approach, the diffusion of CLTS occurred under the strong leadership of influential multilateral donors and established international NGOs. CLTS was first introduced and piloted by either UNICEF, World Bank, WaterAid, or Plan International in 46 countries (Fig. 4). In the remaining 13 countries, other development organizations (e.g., Concern Worldwide, Tear Fund, Irish Aid) played this role (USAID, 2018). Governments were involved in the first CLTS pilots in only a few cases (12/59), typically after an NGO had successfully demonstrated the concept in a small number of villages.

The institutionalization of CLTS proceeded differently in Asia than in Africa (Chambers, 2009; Deak, 2008; Kar & Milward, 2011). CLTS began in Asia (Bangladesh 1999, Fig. 1), where the approach was championed by NGOs, with the World Bank’s Water and Sanitation Program (WSP) facilitating the diffusion of the approach in political circles. Because the water and sanitation sector in Asia is generally less dependent on external funding than it is in Africa (World Health Organization, 2017), donors had fewer opportunities to quickly influence policies, and CLTS uptake was slower. In Africa, CLTS was championed by UNICEF, which was both well-connected and well-respected in the sanitation sector (Bevan, 2011). One of our key informants from Africa reported that CLTS had been implemented in his country “because UNICEF wanted to implement it.” More generally, the migration of CLTS between Asia and Africa may have been aided by the movement of many CLTS champions who started their careers in NGOs or donor agencies in Asia at the time CLTS emerged to new positions in Africa, facilitating the spread of the innovation across continents (key informant interviews). For example, UNICEF staff exposed to CLTS in Asia played an important role in the introduction of CLTS in Africa and encouraged many African governments to adopt CLTS in their national strategy (Bevan, 2011; Kar & Milward, 2011).

In addition to Kar himself and the donor community, consultants and other academic members of the rural sanitation community played a central role in the diffusion of CLTS. Professor Robert Chambers of the Institute of Development Studies described this group of diverse individuals in a 2011 article in the Guardian (Chambers, 2011) as “an international movement, itself a community of like-minded people who are inspired by the vast potential of the CLTS approach, driven by passionate champions. Many become energetically committed once they have experienced the power of CLTS – how it enhances human wellbeing.” This combination of actors working at different geographical scales (from local to global) to promote CLTS is consistent with what is found in policy diffusion in other sectors (McCann & Ward, 2013).

Local champions played a particularly important role in countries where rural sanitation was highly decentralized, like Indonesia and Kenya after its constitution was reformed in 2010 (Cheeseman, 2016). In Zambia, Chief Macha, from Choma district – one of the first districts to achieve ODF status in the country – has used his position to advocate for CLTS and improved sanitation with a multitude of other Zambian stakeholders, including ministers, elected councilors, fellow chiefs, and rural community members (Zulu, Harvey, & Mukosha, 2010). A similarly important role was played by Chief Mkanda, Traditional Authority Chief in Malawi (Kar & Milward, 2011). More generally, local champions identified through the first CLTS in-country workshops played an important role in spreading CLTS in their regions and in convincing national level actors (Bevan & Thomas, 2009; Kar & Milward, 2011). One key informant from Fiji commented that communities were more easily persuaded by their peers (as opposed to external facilitators), such as someone from a nearby village who could attest that change was possible.
5.2. The role of face-to-face interactions and experiential learning

Since the early 2000s, this global CLTS community relied on connections made at distance – via email or by reading policy documents from other countries – but also on in-person interactions to increase their knowledge about CLTS, build policy coalitions that favored its adoption and spread, and discuss ways in which the approach could be improved. Many of these connections and interactions have been facilitated by the CLTS Knowledge Hub, which, as described in its website (IDS, 2019a), was founded in 2006 to support the scale-up of inclusive CLTS and rural sanitation approaches by “proactively co-generating and co-creating practical knowledge, identifying and sharing innovations,” … “making linkages between practitioners, policy-makers, researchers and communities, and supporting champions.”

Fig. 3. Involvement of Kamal Kar in the spread of CLTS. Sources: (Balfour et al., 2014; Galbraith & Thomas, 2009; IDS, 2019a; Kar, 2010; Kar & Chambers, 2008; Kar & Milward, 2011; Kar & Pasteur, 2005; Mehta, 2009; Protos, 2016; UNICEF, 2015; UNICEF WCARO, 2011; Venkataramanan & Shannon, 2015). “Engaged outside of country” means that country representatives engaged with Kar at workshops in other countries.

Fig. 4. Institutions that initially introduced CLTS in the 59 countries for which information is available (LAC countries not shown). External organizations (UNICEF, World Bank, WaterAid, Plan International, etc.) played a role in all countries, either with (12/59, orange) or without (47/59, purple) initial government involvement. Sources: (Balfour et al., 2014; Galbraith & Thomas, 2009; IDS, 2019a; Kar, 2010; Kar & Chambers, 2008; Kar & Milward, 2011; Kar & Pasteur, 2005; Mehta, 2009; Protos, 2016; UNICEF, 2015; UNICEF WCARO, 2011; Venkataramanan & Shannon, 2015). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)
Face-to-face interactions in conferences – and the formal and informal opportunities they create – are documented as playing a fundamental role in the establishment of policy coalitions and stimulating imitation and competition (McCann, 2011; McCann & Ward, 2012, 2013; Montero, 2017a). As one key informant explained, many actors were first exposed to the idea of CLTS's effectiveness via discussions with their colleagues at conferences. Zulu et al. (2010; pg. 132) document an important informal opportunity – a restaurant encounter between Kamal Kar and Chief Macha from the Choma district in Zambia – as being fundamental to convince Chief Macha to participate in the last day of the hands-on training workshop that kick-started CLTS in Zambia in 2007. CLTS stakeholders meet regularly at a variety of events: ministerial conferences such as AfricaSan and SACOSAN, academic conferences, and meetings convened by donors. The CLTS community – under the convening power of the CLTS Knowledge Hub or donors – also organizes specific meetings for its members immediately before or after academic conferences. For example, a CLTS Sharing and Learning workshop was convened in Islamabad in April 2018, the day before SACOSAN started. In preparation for AfricaSan in Cape Town in 2019, two regional practitioner workshops were organized by the CLTS Knowledge Hub in 2018 in Tanzania and Senegal.

Experiential learning also was instrumental to the diffusion of CLTS. The role of practice, experience, and visual perception in the learning process is not new to scholars who have documented their importance in other contexts (MonTERO, 2017A; WayLAND, 2006). In the specific case of CLTS diffusion, its relevance is well illustrated by this quote from then World Bank Water and Sanitation Program staff Shafiul Azam Ahmed in 2008:

“[T]he most significant change in mindset took place during the visit to CLTS villages. Despite the heat and dust, the participants spent hours walking around the villages and talking to the villagers. They were spellbound by the remarkable achievement and the simplicity of the approach. Every household in these villages sported a clean toilet. There was no subsidy given. The villagers organized themselves into an effective force to end open defecation. Seeing was believing. What little skepticism was there among the participants was dispelled through the cordial discussion with the villagers. The villagers animatedly presented their struggle to end open defecation. Despite poverty and illiteracy, the CLTS approach ignited peoples' confidence. The workshop participants departed with hearts full of hope. This event also bonded the government officials of the two neighboring countries in a rare partnership, which continued through exchange visits and regional meetings” (AhMED, 2008).

These experiential learning opportunities occurred during study tours or regional workshops. In the case of CLTS, study tours were first used by WSP to “transfer” CLTS from Bangladesh to India, and proved especially useful in some countries in Asia, where government officials were reluctant to abandon subsidies and needed to see proof-of-concept (key informant interviews). CLTS study tours were employed with two goals in mind: a) to expose policy makers to the approach as applied in other countries to create consensus around a new national policy; and b) to mobilize different levels of government and increase interest in deploying the policy in different parts of a country. For example, key senior officials from Indonesia visited Bangladesh and India after a CLTS training to create support for changing the national sanitation policy in their own country (ChAMBERS, 2009). Similarly, before CLTS was introduced in Lao PDR in 2008, a number of study tours were organized: WSP took a team of national and provincial level government staff to Indonesia to learn from its Total Sanitation and Sanitation Marketing Project (TSSM), which incorporated some elements of CLTS; the NGO Concern Worldwide brought a team of provincial government staff to Cambodia to visit the Royal Government/UNICEF CLTS program, and the NGO SNV also brought national and provincial government staff to Cambodia to visit the Cambodian Ministry of Rural Development (MRD) and Swiss Red Cross CLTS program (Lao PDR Wash Technical Working Group, n.d.). In Bangladesh, CLTS pilot programs in a given district were often showcased to officials from neighboring districts to build local coalitions in support of nationwide expansion (Ahmed, 2008). Visitors were sometimes taken to communities where CLTS had not been implemented to accentuate the progress of triggered communities. One visitor reported that “it was not difficult to be impressed seeing the enthusiasm and motivation of well-triggered groups of villagers” (Mukherjee & Shatifan, 2008).

Regional workshops that included field visits were typically convened by lead organizations (WSP, UNICEF, Plan International, and the CLTS Knowledge Hub), but differed from study tours because they also provided plenty of opportunities to reflect and share in a more workshop-type environment. They also had broader geographic reach. For example, in November 2008, a Francophone workshop was held in Bamako, Mali and was attended by government, NGO and UNICEF staff from 10 countries. A second regional workshop was held in Nigeria in March 2009 and was attended by government representatives from the five Anglophone countries in the region (Bevan & Thomas, 2009).

The early workshops were used to give participants an understanding of what CLTS was about, experience a triggering event (via a study visit), and witness first-hand communities committing to eradicate open defecation (Kar & Milward, 2011). The ultimate goals of these workshops were twofold. First, to create a multi-country/multi-agency coalition of actors: “These workshops offer a unique opportunity to learn from each other by bringing together people and perspectives from different countries, organizations and professional backgrounds. They allow for all participants to share their experiences, insights and challenges, and to network and establish linkages with other actors in the field. IDS believes that this practice of sharing and learning plays a vital role in improving the practice and policy around CLTS” (Bongartz, 2008). Second, these workshops often ignited the introduction of CLTS to countries in their region. CLTS was introduced in Maharashtra, India soon after Indian officials attended a workshop convened by WSP in Bangladesh in 2002 (Kar & Milward, 2011). A workshop organized by Plan International in Tanzania in 2007, during which participants witnessed triggering events in ten villages, was the first step in the introduction of CLTS in Uganda, Kenya, Malawi, Zambia, Zimbabwe, and Tanzania (Musyoki, 2007). Workshops held by UNICEF in Mali and Nigeria in 2008 and 2009, respectively, also included “hands-on” activities and encouraged the adoption of CLTS in fifteen West and Central African countries (Bevan & Thomas, 2009; UNICEF WCARO, 2011). In the last five years, workshops have been used to share implementation experiences and discuss how to overcome the challenges of the CLTS approach. Examples of recent topics discussed include sustainability, movement up the sanitation ladder, and equity and inclusion (IDS, 2016, IDS, 2018a, IDS, 2018b).

5.3. The role of different types of evidence in the diffusion of CLTS

The widespread implementation of CLTS occurred despite mixed evidence on its effectiveness across different contexts, and with limited reliance on robust evidence. We note that this is far from rare in international development: policy adoption is rarely linked to evidence on effectiveness (MonTERO, 2017C), but rather frequently driven by other reasons such as the worldviews or interests of those who have power (Meinzen-Dick, 2007; Molle, 2008; Mosse, 2004; Rap, 2006; Roe, 1991; Rusca et al., 2015);
“influential concepts in policy making are not merely neutral or scientific” (Molle, 2008: pg. 132). Further, policy adoption often ignores existing evidence on the shortcomings of the proposed approach and on the conditions under which it is likely to perform well or poorly (Meinzen-Dick, 2007).

Sanitation practitioners have relied on two types of data as evidence of CLTS’s effectiveness. The first type are program data, which are collected by implementing organizations as part of their routine monitoring/evaluation (M&E) and reporting processes. When carefully collected, stored, and processed, program data allow implementers and donors to measure progress towards targets, such as the number of villages triggered or becoming ODF. In Kenya, Indonesia, Tanzania, and Zambia, program data from different implementers have been aggregated into centralized monitoring information systems (MIS), sometimes with public platforms allowing to visualize progress nationally (e.g., Ministry of Health, n.d.). However, relying exclusively on program data to assess CLTS effectiveness can be problematic, as indicated by four multi-country evaluations (Robinson, 2016; UNICEF, 2013, 2015; Venkataramanan & Shannon, 2016). First, baseline data on latrine coverage are often not collected systematically, leading to difficulties in estimating progress (Venkataramanan & Shannon, 2016). Second, most monitoring efforts focus on community ODF status, a binary indicator that does not capture nuances in household latrine coverage (Robinson, 2016; Venkataramanan & Shannon, 2016). Third, program data are usually not third-party verified, which often leads to inaccuracies and inflation of results (Robinson, 2016; UNICEF, 2013). More generally, implementing organizations may be naturally disincentivized from self-reporting disappointing results.

The second type of data that sanitation practitioners rely on to quantify progress is information on ODF districts or regions compiled by local governments. These data typically reflect the combined achievements of several CLTS programs and thus offer a broader picture than program data. Importantly, these data help stimulate local authorities by creating a sense of competition between districts or regions. Across Sub-Saharan Africa and Asia, there are a number of administrative areas reported to have become fully ODF following the implementation of CLTS activities. For example, in Kenya, Busia County was certified ODF in 2016, and Siaya, Isiolo, and Kitui counties are expected to become fully ODF following the implementation of CLTS activities. By 12 percentage points on average (95% CI: 0%, 27%) compared to 27 percentage points (95% CI: 14%, 39%) for the Indian TSC (Garn et al., 2016). Similarly, the 2018 review found increases in latrine coverage attributable to CLTS ranging from 4 to 32 percentage points (Venkataramanan et al., 2018). We have reviewed two additional randomized controlled trials, one before-after comparison, and two comparative cross-sectional studies (too recent to have been included in the prior reviews) (Abramovsky, Augsburg, & Oteiza, 2018; Gebremariam, Hagos, & Abay, 2018; Harter, Mosch, & Mosler, 2018; Harter & Mosler, 2018; Yeboah-Antwi, Biemma, Hamer, MacLeod, & McCallum, 2017), which reported increases in latrine coverage ranging from 0 to 42 percentage points compared to controls. With respect to open defecation, the two prior systematic reviews found reductions ranging between 0 and 33 percentage points (Garn et al., 2016; Venkataramanan et al., 2018). Of the five additional more recent studies that we reviewed, four reported on open defecation, with reductions ranging between 0 and 50 percentage points (Abramovsky et al., 2018; Gebremariam et al., 2018; Harter & Mosler, 2018; Yeboah-Antwi et al., 2017).

Further, independently generated evidence shows that CLTS does not work equally well in all contexts, as posited in the CLTS Handbook (Kar & Chambers, 2008). In Table 2, we list the factors reported to positively affect ODF achievement and/or sustainability, organized into four categories: household characteristics, community characteristics, enabling environment, and program implementation. Favorable household-level factors include financial resources, being female-headed, latrine quality, and individual matching (Arnold et al., 2010), appears to have played little role in the diffusion of CLTS. This can be attributed to a number of factors. First, the sense of urgency that grew around the IYS and the sudden opportunities for development organizations to get sanitation funding may have motivated implementers to charge ahead even without strong published evidence. “Seeing this huge surge of interest in sanitation, and this feeling that [...] after all these years, maybe we could make some inroads and it could become a solvable problem; I couldn’t then stop them and say “Hey, no, no! Everybody we have to wait until we have some research and some evidence base” (Key informant interview). Second, while rigorous research in the WASH sector already existed (Fewtrell et al., 2005), research on sanitation was limited and the WASH departments of important donor organizations did not have a strong research culture. In the words of one of our key informants, “Practitioners in the WASH sector [...] unlike in health and nutrition, were not familiar with using an evidence base. [...] We were introducing things without really knowing enough about where they worked and where they didn’t. It was all based on enthusiasm and desperation.” More generally, practitioners often lack the training or time to scrutinize the quality of performance analyses or their underlying data. Third, the independently generated quantitative evidence on CLTS’s effectiveness was limited, especially before 2011. As noted by rural sanitation experts, the amount of published research on CLTS’s effectiveness is notably small relative to the scale at which the approach is implemented globally (USAID, 2018; Venkataramanan, Crocker, Karon, & Bartram, 2018). A meta-analysis of sanitation interventions identified nine controlled trials and before-after comparisons about CLTS meeting a given explicit quality standard and another five on the Indian TSC (which includes elements of CLTS in combination with subsidies and other measures) (Garn et al., 2016). In 2018, a systematic review added eight more quantitative evaluations of CLTS and the Indian TSC (Venkataramanan et al., 2018). Out of these 22 studies, 19 were published after 2011, i.e. after the bulk of CLTS uptake (Figure 2).
latrine ownership (as opposed to latrine sharing). Favorable community-level conditions include small population size, remoteness, high social capital and cohesion, strong local leadership, high baseline rate of open defecation, favorable soil and water table conditions, access to water supply, and absence of surrounding vegetation or water body facilitating open defecation. With respect to the enabling environment, access to construction materials, committed government officials, and no prior history of subsidies are more likely to see CLTS succeed. Finally, such aspects of program implementation as quality of triggering, intensity and duration of follow-up, and involvement of natural leaders, village chiefs, and teachers have been linked to ODF achievement and sustainability.

If the growing body of rigorous research studies is to serve as a base for future developments in the rural sanitation sector, it will be critical to increase the capacity of practitioners to discern different types of evidence and understand the role that each of them can play. Equally important will be to ensure that researchers provide evidence that is of use and applicable to the issues that decision-makers are grappling with, present their results in an implementer-friendly and accessible format, and participate in forums where practitioners meet regularly such as the workshops organized by the CLTS Knowledge Hub. Finally, researchers and practitioners should meet regularly in experiential learning events.

6. Conclusion

Over the past twenty years, CLTS has spread to dozens of countries and is now employed by the majority of development partners operating in rural sanitation. We have examined the factors that drove the diffusion of CLTS, making the case that CLTS was embraced because it was perceived as a quick and effective solution to the problem of open defecation, one which was in line with decentralization and community participation paradigms, at a time when donors and governments were looking for strategies to meet
the MDG for sanitation. CLTS spread under the leadership of influential donors, NGOs, and persuasive practitioners. Face-to-face interactions among members of this network and local governments at conferences and workshops played a central role in the diffusion of the approach, as did the use of experiential learning during study tours and workshop field visits. Robust scientific evidence played little role in the diffusion of CLTS and the rural sanitation sector remains largely driven by weak evidence.

While the SDGs emphasize the need to reach everyone forever, there is growing indication that CLTS’s outcomes may not be sustainable or equitable (Robinson, 2016; USAID, 2018), with the poorest households more likely to revert to open defecation after some time (Odagiri et al., 2017; Robinson & Gnilo, 2016; USAID, 2017). Donors and policy makers are increasingly expressing a need for “post-ODF” strategies to address these challenges, and supply-side enhancements like market-based sanitation and targeted subsidies are increasingly believed to be needed supplements of CLTS.

It is encouraging to see increased attention on evidence-informed policy-making in the development sector (Newman, Capillo, Famurewa, Nath, & Siyanbola, 2013). Scholars have articulated the requirements for evidence-informed policy-making into three components: i) demand for research by implementers and practitioners, ii) supply of timely and relevant research, iii) effective knowledge communication (Newman et al., 2013). The health sector provides useful examples of strategies to increase the use of evidence in decision-making.

Authors play a central role in both increasing policy-makers’ demand for research and ensuring that there is an adequate supply of policy-relevant research that is also timely for decision-making. Strategies that donors can adopt include promoting the co-sponsoring of research by local stakeholders, integrating decision-makers in review panels responsible for shortlisting funding applications, and encouraging regular exchanges between researchers and decision makers (Lomas, 2000). Further, it is well established that in-person contact between researchers and decision-makers has enhanced the use of evidence in the health sector (Innvær, Vist, Trommald, & Oxman, 2002), not only at the dissemination stage but also during the research process itself (Rishworth, Elliott, Dixon, & Clarke, 2016). To increase these in-person interactions, researchers should thus attend practitioners’ conferences and workshops such as those organized by the CLTS Knowledge Hub to showcase and explain research findings, as well as to identify additional research needs. Finally, the communication of research findings deserves elevated attention: experience from the health sector shows that research that includes a clear summary with policy recommendations is more likely to be used by decision makers (Innvær et al., 2002). As the new generation of rural sanitation policies is developed, the onus is not only on policy-makers and NGOs, but also on donors and researchers to apply these lessons and make more deliberate efforts to enhance evidence-based decision-making in the rural sanitation sector.

Finally, it may also prove useful to reach beyond current sector preoccupations with CLTS-driven approaches, and turn to history to better understand the political systems that reduced open defecation in various regions before the MDG and SDG eras. For example, multiple East Asian countries initiated strikingly effective sanitation improvement efforts in the 1960s, when their per capita income levels were similar to many sub-Saharan African countries (Northover, Ryu, & Brewer, 2016). The results of these efforts provide compelling evidence for successful sanitation strategies. Analyses of the factors that promoted rapid sanitation gains in four of these countries – Singapore, South Korea, Malaysia, and Thailand – identified the importance of the following conditions: high-level political leadership; the integration of sanitation into broader public health, housing, and hygiene improvement programs; well-coordinated multi-sector approaches that spanned different ministries; and incentives for improved performance that were combined with high-level motivation to build cohesive societies (Northover et al., 2016). Evidence for the broader requirements for achieving sanitation objectives may also help improve the reach and sustainability of sanitation programs (Mason, Matoso, & Hueso, 2016).

Declaration of Competing Interest
None.

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Author contributions

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