A short history of how we think and talk about sanitation services and why it matters
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ABSTRACT
How we think and talk about sanitation services has changed. The very notion of a sanitation service has been transformed from one focused on technology to one focused on the sustainability of the wider sanitation system. This paper explores the transformation from technology to system by drawing from a review of more than 200 pieces of literature published between 1970 and 2015. Seven prevalent perspectives on sanitation service provision are introduced: sanitation services as a basic human need; increasing service coverage through appropriate technology; the emergence of community-participation and community-management; an interest in private-sector participation; the sanitation crisis being viewed as a crisis of governance; sanitation considered inherently political and the current focus on sustainable sanitation systems. These seven perspectives form a useful conceptual frame, which may guide the thinking of sanitation practitioners, policy-makers and academics as they begin to consider how to meet the water and sanitation Sustainable Development Goal by 2030. In this paper, four examples of how the conceptual frame might be used to support thinking are provided.

Key words | history, MDG, perspectives, sanitation, SDG, sustainability

INTRODUCTION
How we think and talk about sanitation has changed and continues to do so. This is evident from looking at the three international sanitation goals set during the past five decades. In the late 1970s, the goal of providing ‘Services for all by the end of the century’ (United Nations [UN] 1990) was set as part of the International Drinking Water Supply and Sanitation Decade. In the 2000s, as part of the Millennium Development Goals the world promised to ‘reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation’ (Black & Fawcett 2008). This year (2015), the Sustainable Development Goals (SDGs) were launched and with them the goal: ‘ensure availability and sustainable management of water and sanitation for all’ by 2030 (UN 2015). Not only has what the world has sought to provide changed, from ‘services’ to ‘availability and sustainable management of sanitation’, the very notion of what constitutes a sanitation service has changed. This transformation is the focus of this paper, which explores how sanitation services have been described during the past five decades and why it matters how we think and talk about sanitation services.

This paper makes three important contributions to the sanitation literature. Firstly, it offers an accessible account of seven perspectives on sanitation services identified through an extensive literature review. Secondly, it offers a conceptual frame, which may be used to guide thinking and as a foundation for discussing past, present and future practices and policies. The latter will be particularly useful as the sector reorients its efforts towards fulfilling the sanitation SDG. Four specific examples of how the conceptual frame might guide thinking are provided.

The paper has five sections: introduction; method; a description of the seven perspectives on sanitation services; a discussion; and a conclusion summarising key implications.

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The seven perspectives are introduced in chronological order through seven subsections.

METHOD

This paper draws from a review of 230 pieces of sanitation literature published between 1970 and 2015. The purpose of conducting the review was to explore how the notion of a sanitation service has changed over time and how sanitation services are currently described.

Academic and non-academic literature was identified using Google Scholar. Specifically, the search string: ‘sanitation service’ AND (‘developing country’ OR ‘developing countries’ OR ‘international development’), was applied. The search was performed for five time intervals: 1970–1979, 1980–1989, 1990–1999, 2000–2009, and 2010–2015. This made it apparent how the amount of sanitation literature has increased over time. The first two intervals returned just 11 (1970–1979) and 38 (1980–1989) results respectively, but the number grew rapidly in the following intervals. The period of 1990–1999 returned 155, 2000–2009 returned 965 results and the shorter period of 2010–2015 returned 1150 results. The search furthermore made it clear that sanitation literature in the 1970s and 1980s mainly was published by large donor organisations, and that academic interest in sanitation slowly emerged during the 1990s. Literature was also found in the World Bank’s open database and the Joint Monitoring Programme (JMP) reports, the World Health Organisation’s (WHO) Global Analysis and Assessment of Sanitation and Drinking Water reports were sourced through relevant websites. Only English language literature was reviewed.

During the initial search 2,545 documents were compiled and reduced to 123 through a series of screenings based on relevance and quality. The first screening was performed by reviewing document titles and abstracts, which reduced the number from 2,545 to 230 by excluding documents which were not specifically about sanitation services, such as documents on emergency response, solid waste management, malaria or housing. A second screening of abstracts reduced the number further to 123, which were considered highly relevant in relation to the discussion of sanitation services. These documents were chronologically ordered and perspectives on sanitation services were extracted from each through detailed review.

Around 40% of the reviewed literature comprises journal papers, conference proceedings and book chapters, and another 40% are more general reports published by donor organisations and research institutions. The remaining 20% is a combination of policy documents, for example on human rights and the SDGs, and specific case studies on sanitation services in a specific city or country. The documents represent a broad range of disciplines, spanning health, economics, engineering and social sciences. Interestingly, early literature on sanitation services often represented a strong disciplinary focus, while recent literature tends to be more multi-disciplinary.

Limitations

An important limitation of any review of sanitation literature is the strong connection between water and sanitation literature. The sanitation sector’s strong dependency on a shared literature base, often inclined towards water services, has already been widely recognised and it is not the aim of this paper to extend this discussion. However, it is worth noting that the inclination towards water was clearly seen during the review process. This was mitigated by excluding literature that seemed to focus mainly on water despite mentioning both water and sanitation services. Furthermore, when referring to literature in this paper, it is clear whether the literature talks about just sanitation services or both.

The breadth of topics covered by the sanitation literature over 45 years is significant and it has not been possible to include them all in this paper. To ensure sufficient depth of analysis on the topics covered, topics that were less prevalent in the literature have been excluded. Some readers may therefore note a lack of references to topics such as menstrual hygiene, behaviour change communication, community-led total sanitation and sanitation for disabled. The sector can continue to build on this short history of how we think and talk about sanitation, by adding topics to the conceptual frame presented in this paper.
SEVEN PERSPECTIVES ON SANITATION SERVICES

Seven prevalent perspectives on sanitation services were identified through the review of literature published since 1970: a basic human need; appropriate technology; community-participation and community-management; private sector participation; a crisis of governance; inherently political; and sustainable sanitation system. We are using the term perspective rather than terms such as paradigm or trend, often used in development literature, to highlight that previous prevalent perspectives continue to be relevant even as new perspectives emerge. The seven perspectives should be seen as overlapping and all contributing to an evolving understanding of the complexity of sanitation services in developing countries—none have become obsolete.

Figure 1 illustrates the continuous and overlapping nature of the seven perspectives. They are visualised as strings being tied together to highlight their often interwoven nature. The timeline in the figure is an approximation. Many perspectives likely existed earlier than indicated without a strong prevalence in the literature.

The literature review showed a strong correlation between the development ‘paradigms’ identified in the more general development literature by among others Kremer et al. (2009), Duncan & Williams (2010) and Haynes (2008) and the seven perspectives on sanitation services presented in this paper. Figure 2 below illustrates this close correlation by using colours to indicate where there are similarities between the development paradigms identified by Kremer et al., Duncan and Williams, and Haynes and the perspectives identified in the sanitation literature.

While describing each of the seven perspectives on sanitation services, the correlation between the development ‘paradigms’ and the perspectives presented in this paper is continuously described.

Sanitation as a ‘basic human need’

Sanitation did not meaningfully enter the development debate until the late 1970s, when attention in international development shifted from economic growth to human development. Until then, ‘development’ had, by Western...
countries, primarily been considered as a way to prevent Fascism/Nazism re-emerging and containing Communism (Haynes 2008; Tornquist 2009). Western countries were giving developing countries a ‘financial push’ to fund income-generating infrastructure (Kremer et al. 2009). However, sanitation was not considered income generating, and a financial push was therefore not given to build sanitation infrastructure. With the shift from economic development to human development, more people-centred development perspectives emerged (Haynes 2008; Kremer et al. 2009) and sanitation gained interest. Development moved towards fulfilling ‘basic human needs’ as illustrated in Figure 2. In practice this meant ensuring sufficient food, clean water, adequate shelter, primary health care, elementary education and functional sanitation to the world’s poorest (Haynes 2008).

The shift towards ‘basic human needs’ also meant that sanitation was seen as the responsibility of the state. For example, in 1978, World Bank President Robert McNamara stated that countries must improve access to essential public services and ‘among these essential public services are water supply and waste disposal’. (Kalbermatten et al. 1980). An important reason for placing the responsibility for sanitation with the state was that sanitation was seen as a way of protecting public health (Young & Briscoe 1988). The World Bank therefore started lending money to help governments fund the implementation of centralised sanitation.

It is not surprising that sanitation only meaningfully entered the development debate when focus moved from ‘income-generation’ to fulfilling ‘basic human needs’. Generating an income (Trémolet et al. 2010) or even achieving cost-recovery (Abeysuriya et al. 2005) from sanitation is still today a major challenge. As described later in this paper, the funding challenge has largely shaped the sanitation debate over the last five decades.

**Appropriate technology and increasing service coverage**

The years 1981–1990 were declared the International Water and Sanitation Decade (the Decade) (Christmas & de Rooy 1991), with the goal of providing ‘Services for all by the end of the century’ (UN 1990). There was a severe lack of sanitation infrastructure, so increasing service coverage initially meant constructing this infrastructure.

However, the lack of sanitation infrastructure posed a major funding challenge and a change of strategy was needed. The World Bank lending programme, which had so far focused its attention on centralised sewerage and service coverage, had been concentrated in major cities (Kalbermatten et al. 1982) without sufficiently reaching the
poor (Wakelin 1980). Based on findings from a two-year-long research project, the World Bank proposed a major shift in thinking—away from implementing centralised sewerage towards implementing ‘appropriate technologies’—of low cost alternatives to conventional sewerage systems (Kalbermatten et al. 1980; Wakelin 1980; Shuval et al. 1981; Basher & Shahalam 1985). The new strategy was simple: If the cost of infrastructure implementation could be kept low with ‘appropriate technologies’, higher sanitation coverage could be reached (Kalbermatten et al. 1980).

The shift towards appropriate technologies led to a new approach to sanitation planning. Kalbermatten et al. (1982), for example, suggested that the selection of technology should be based on extensive interaction with beneficiaries and that various disciplines such as sanitary engineers, public health specialists, economists and behavioural scientists should be involved in the planning of sanitation interventions. Importantly, Kalbermatten et al. saw sanitation planning as an ongoing and iterative process and believed that appropriate technologies could be upgraded over time through incremental improvements as funding became available (Kalbermatten et al. 1982). This new approach to sanitation planning proposed by Kalbermatten et al. (1982) has had significant and lasting impact on how sanitation planning is being approached today (Kennedy-Walker et al. 2014).

At the end of the Decade, the goal of full access to water and sanitation services had not been met despite the significant change in strategy. However, important lessons had been learned. One such important lesson was that reliable data on the level of service coverage were needed for planning and advocacy. This led to the introduction of the JMP by the WHO and United Nations Children’s Fund (UNICEF) (Watters 1994).

Community-participation and community-management

Learning from the Decade also led to a shift from supply-driven to demand-driven approaches to water and sanitation service delivery. Community-awareness, community-participation, hygiene education and the involvement of women was believed to be essential to the success of water and sanitation interventions (Christmas & de Rooy 1991; McGarry 1991; Cairncross 1992).

Community-participation has, since the shift towards ‘Basic Human Needs’, been a central part of the general development discourse (Haynes 2008). In relation to water and sanitation services, households and communities were increasingly considered active participants in the development process rather than passive recipients (Christmas & de Rooy 1991). They became engaged in making decisions concerning the type of infrastructure, and took part in implementation (White 1981). Due to women’s role as primary users and caretakers of new latrines, their preferences and opinions received special attention (Elmendorf & Isely 1981).

In the years following the Decade the concept of community-management also emerged. Learning from the Decade had shown that suitable provision for ongoing operation and maintenance (O&M) was needed if water and sanitation services were to remain reliable (Najlis & Edwards 1991) and it was believed that governments would be unable to deliver such services (Carter et al. 1999). Communities on the other hand could clean latrines, unplug sewer pipes and empty septic tanks (Hogreve et al. 1993). The idea was that if communities received technical support from authorities, they would become able and willing to take on the responsibility for ongoing O&M (Najlis & Edwards 1991). The sanitation sector therefore began to focus on how to foster a sense of ownership among users (UN 1990; Najlis & Edwards 1991). While community-management of sanitation services was widely discussed during the 1990s, in practice the concept was mainly applied in the context of rural water.

The promotion of community-participation and community-management was influenced by an emerging wish for (at least partial) ‘cost-recovery’ (McCommon et al. 1990; UN 1990). Funding challenges had been experienced during the Decade and if further infrastructure expansion was to be realised, funding had to be used more effectively, and alternative sources of funding had to be identified (Najlis & Edwards 1991). People were one potential source of financing, and it was believed that their willingness to pay for services could be fostered through community-participation and community-management (McCommon et al. 1990). If communities could become willing to pay for services, this would mean major cost savings for governments and donors who could then concentrate funding on
increasing coverage (McCommon et al. 1990; UN 1990). The idea of ‘cost-recovery’ is widely found in the water and sanitation literature published in the 1990s, and willingness-to-pay studies also emerged in the 1990s as a measure of demand, especially for urban sanitation services (Whittington et al. 1993; Altaf & Hughes 1994).

While sanitation had previously been seen as a public service and the responsibility of the state, household and communities were now considered central to ongoing water and sanitation service provision. This change in perspective was influenced by the shift from centralised sewerage to appropriate technologies, but also by general trends in the development sector—it was generally believed that communities would be better off taking responsibility for their own development.

**Private sector involvement**

In the 1980s and 1990s, privatisation became part of the international development debate (Kremer et al. 2009). Oil prices were rising and the debt of developing countries increasing (Haynes 2008). The culprit was believed to be poor macroeconomic policies and laws working as barriers for the development of free markets. Privatisation was promoted as part of the Washington Consensus (Kremer et al. 2009), which advocated downsizing the public sector through privatisation and economic liberalisation (Brinkerhoff 2008).

Privatisation was introduced in the water and sanitation literature in the late 1980s. Focus was mainly on the privatisation of publicly run urban water and sanitation utilities (McGarry 1991; Prasad 2006; Murray et al. 2011). While it was widely discussed who was better placed to provide water and sanitation services—the public or private sector—in reality only a few sanitation utilities in developing countries were privatised (Allen 2010). However, the privatisation of sanitation services never gained as much momentum as the privatisation of other services (Davis 2005), and since 2000 there has even been a global trend towards re-municipalising of services. Re-municipalisation refers to previously privatised services returning to local authorities or public control (Lobina et al. 2014).

Importantly, a range of alternatives to full privatisation of sanitation services has emerged during the last few decades. This includes various forms of private-sector involvement such as public-private partnerships (Budds 2000; Seppala et al. 2007; Davis 2005) and hybrid management models (Tiberghien 2013). As Allen (2010) points out, it is today widely accepted that both the private and the public sectors have useful competencies to contribute to sanitation service provision and it is often argued that their competencies should be combined.

In recent literature, there has been an increased interest in the role small-scale service providers could play in delivering sanitation services. It has been observed that many small-scale sanitation service providers are already active in the sanitation sector in developing countries (Murray et al. 2011). They make a living by building sanitation infrastructure, removing and transporting waste, dumping and treating waste, or managing public toilets (Davis 2004; Schaub-Jones 2010, 2012; Gero et al. 2014). The role of small-scale service providers is, however, still poorly understood and utilised, but recent research has explored, for example, how small-scale providers can earn an income from the reuse of human waste (Murray et al. 2011) and more generally how small-scale private service providers and social enterprises can be supported (Gero et al. 2014; Murta et al. 2014). The interest in private sector involvement, especially the involvement of small-scale service providers, continues to increase and will likely continue to be an important part of the sanitation literature post-2015.

**The sanitation crisis as a crisis of governance**

Around the start of the twenty-first century, the role of the state was again reappraised in international development (World Bank 1997; Annan 2001). It was argued that the reforms advocated by the Washington Consensus had not worked because a ‘solid governance and institutional foundation’ was lacking (Kremer et al. 2009) and that appropriate institutional arrangements had to be implemented to ensure public service delivery.

The interest in governance and institutional arrangements also influenced the sanitation literature. This led to several pieces exploring corruption and transparency in the sanitation sector (Davis 2004; Plummer & Cross 2006) and on how to strengthen accountability mechanisms. The World Bank among others argued that to achieve ‘good
governance’, sanitation service providers needed to be separated from service regulators, and the routes of accountability, in what the World Bank termed the consumer-provider-regulator triangle, needed strengthening (World Bank 2003). This involved changing the role of government from service provider to regulator (Lønholdt 2005). Such an approach was mainly applied to centralised sanitation services, and is based on the idea of applying private sector management techniques to the public sector (Allen et al. 2008).

Towards the end of the 2000s, the approach to ‘governance’ changed yet again from top-down governance to a more society-centred approach. For example, co-production has been described in sanitation literature as a pragmatic acceptance of limited public funding and a profit-seeking private sector, which leads to the notion that the poor are better off providing services for themselves (Allen et al. 2008; Eales et al. 2015). In this sense co-production relates to the concept of community-management, but suggests that the state has a supporting role in service provision. According to Allen et al. (2008), co-production furthermore is not just about using the poor’s inputs (time, money, and labour) to deliver services. They also need to be engaged as political constituencies (Allen et al. 2008). This perspective thus takes co-production further than community-management by looking at the relationship between state and citizens more broadly.

While much has been written about the governance of water services, sanitation governance remains highly under-analysed. In practice, this predilection towards water governance has meant that institutional arrangements for sanitation often have been left to ‘piggyback’ on arrangements used in the water sector (Allen et al. 2008). However, sanitation governance remains an important research topic, and new perspectives on sanitation governance are still surfacing (Ekane et al. 2014; Ross et al. 2014; Putri 2014).

Sanitation as inherently political

At the change of the century, the development sector, for the first time, had no clear theory or strategy (Lindauer & Pritchett 2002; Haynes 2008). After a period of big development theories, it was accepted that ‘there are no “one size fits all” solutions or magic bullets’ (Kremer et al. 2009).

From this, what Kremer et al. (2009) called a more ‘diagnostic approach’ to development emerged. In the sanitation sector, the result was an increase in literature exploring the inherently political nature of sanitation services.

In recent years, the politics of sanitation has been widely explored, for example, through political economy analysis (PEA) studies (Krause 2009; Harris et al. 2011; Kooy & Harris 2012; Willetts et al. 2013). These studies identified drivers behind institutional, political, and historical barriers to sanitation service delivery. Findings indicate that sanitation services have a low priority among politicians in many developing countries, and political preferences tend to go towards investments in highly visible infrastructure (Harris et al. 2011). The PEA studies have improved the sector’s understanding of the inherently political nature of sanitation services, and have also led donors and think tanks to engage more directly in politics (Department for International Development [DFID] 2009; WSP 2009; O’Meally 2013).

One example of such political engagement is the role the Water and Sanitation Program (WSP) has played in the ‘Indonesia Sanitation Sector Development Program’ (Colin et al. 2008). Instead of funding infrastructure, WSP worked with the national planning agency to improve the institutional arrangements for sanitation in Indonesia. Additional aims were to raise political awareness and influence the allocation of funding for sanitation from national and local governments (Colín et al. 2008).

Internationally, the recognition of the inherently political nature of sanitation has also led to changes. For example, the Sanitation and Water for All (SWA) partnership, a gathering of 90 governments, donors, and civil societies, was established in 2006 to accelerate political prioritisation of sanitation and water internationally and nationally. SWA works to create political awareness of the benefits of improving sanitation and water conditions; put sanitation and water on the agenda of the United Nations General Assembly and engage governments in making formal commitments. Another international change has resulted in sanitation being recognised as a human right by the UN General Assembly; and the Human Rights Council (de Albuquerque 2014). This recognition can be seen as building on the previous notion of sanitation as a ‘basic human need’, which placed responsibility for sanitation with the state. Now three decades later, this has been
followed by sanitation being framed as a legal entitlement, symbolising a significant shift from sanitation as charity to sanitation as justice (Langford et al. 2014).

A study of the cost and benefits of sanitation services performed by Hutton & Haller (2004), has played a significant role in influencing the politics of sanitation both nationally and internationally. By systematically mapping the cost and benefits of water and sanitation interventions in developing countries, Hutten and Haller found that the return on US$1 investment ranged from US$5 to US$11 (Hutton & Haller 2004). Their report is one of the most widely cited resources identified during our literature review and has been widely used to argue for better public funding for sanitation and hygiene interventions (Evans et al. 2004).

While much has been written about the importance of thinking and acting more politically smart, it is unclear how widely donors and civil society organisations have actually done so in practice. For example, Fisher & Marquette (2013) have argued that there is a mismatch between a donor’s recognition of the need to work politically and their skills and incentives for doing so. One potential incentive working against the shift in approach is a donor’s need to tell a positive story to retain domestic support and thus a tendency towards optimism rather than realism (Duncan & Williams 2010).

**Sustainability of sanitation systems**

The concept of sustainability is found throughout the sanitation literature. When the concept of ‘sustainable development’ was introduced by the World Commission on Environment and Development in the report ‘Our Common Future’ published in 1987, it was quickly adopted by the water and sanitation sector (Black 1998). However, according to Black (1998), ‘sustainability’ was at the time seen mainly as making sanitation services cost-effective. As previously described, cost-effectiveness was therefore a central theme in sanitation literature in the early 1990s. Since then, sustainability has become a much broader concept in the sanitation literature, and today spans not only financial sustainability, but also environmental and long-term sustainability.

It is not surprising that the concept of sustainability is prominent in current sanitation literature. There is an increased focus on sustainability in society in general, and the SDGs were recently launched. In the sanitation literature the concept primarily manifests as an interest in the environmental sustainability of entire sanitation systems and an interest in the long-term sustainability of sanitation services. Both perspectives represent a shift from earlier preoccupation with infrastructure implementation towards envisioning sanitation as a wider system.

The interest in environmental sustainability of sanitation began around 2000, with an increase in literature on ecological sanitation. This literature emerged from the rural context, and suggested that human excreta and domestic wastewater should be considered a resource rather than waste. The aim was to ‘close the loop’ of nutrients between sanitation and agriculture by safely reusing nutrients contained in human excreta in agriculture (Langergraber & Muellegger 2005; Werner et al. 2009). A strong argument for ecological sanitation was the current rapid depletion of phosphate reserves, resulting in a need to find alternative sources of fertiliser to maintain food security for an increasing world population (Rosemarin et al. 2008).

More recently, interest has turned towards faecal sludge management (FSM), and the development of new methods for measuring and evaluating sanitation sustainability. The FSM literature grew out of the urban context and is concerned with the later stages of the ‘sanitation chain’ for onsite sanitation, generally referred to as the ‘collection, storage, transportation, treatment, and reuse/disposal of human excreta’ (United Nations Institute for Training & Research [UNITAR] 2013; Galli et al. 2014; Peal et al. 2014). FSM literature suggest that the later stages of the sanitation chain are often unmanaged (Peal et al. 2014). Studies have found that 90% of the developing world and 64% of the urban population today rely on onsite sanitation (International Water & Sanitation Centre [IRC] 2008). Hawkins et al. (2014) among others therefore argue that there is a ‘missing link’ in the sanitation service chain, which poses an environmental and health risk. FSM is seen as a way to fill this gap and also as an opportunity for generating an income from human waste, which creates a potential for private sector involvement (Chowdhry & Kone 2012; Strande et al. 2014). Small-scale service providers...
are believed to have a key role to play in FSM. Suggested business models include biogas recovery, compost production, and the use of faecal sludge as industrial fuel (Murray et al. 2011).

Lastly, the interest in environmental sustainability has resulted in a growth in methods for measuring and evaluating the sustainability of sanitation systems. Many of these methods build on well-known approaches to life cycle assessment/analysis taken from other disciplines (McConville & Mihelcic 2007; Flores et al. 2009; Jones & Silva 2009; Cruz-diloné et al. 2014).

In addition to environmental sustainability, the long-term sustainability of sanitation services is increasingly being explored in the literature. There has been a growing recognition of the risk of ‘slippage’—a term coined in India which refers to the slipping back of a community from fully covered with water or sanitation services to partially or non-covered (Lockwood & Smits 2011). The United Nations, among others, has warned of the worldwide risk of slippage on the gains made in extending water and sanitation services unless more attention is given to the maintenance of services and assets (UN-Water & WHO 2012). Inspired by their work in rural water, IRC recently suggested that to ensure the long-term sustainability of sanitation services, the sanitation sector must move focus from delivering infrastructure to providing ongoing services (Verhagen & Carrasco 2013). They therefore suggest viewing physical infrastructure as something that needs to be maintained indefinitely (Lockwood & Smits 2011; Verhagen & Carrasco 2013) and offer a Service Ladder as an alternative to the traditional technology based sanitation ladder. The Service Ladder is developed from the perspectives of the user, the provider and the environment, and assesses service levels based on their accessibility, use, reliability and environmental protection (Potter et al. 2010).

The increased attention given to the sustainability (environmental and long-term) of sanitation services represents a move away from the previous infrastructure focus towards a system focus. By viewing sanitation as part of a nutrient loop or a chain, we are reminded that the physical infrastructure at the household level is part of a larger system. The service delivery approach similarly reminds us of the need for appropriate governance structures and of the significant cost associated with O&M. In the discussion section below, this fundamental shift in perception—from technology to system—is described and it is discussed in further detail.

**WHY DOES IT MATTER?**

It is easy to be pessimistic about the sanitation sector’s ability to reach the SDG goal of ensuring ‘availability and sustainable management of water and sanitation for all’ by 2030. Previous international sanitation goals have not been fulfilled, sanitation coverage rates are falling due to population increase (WHO & UNICEF 2012) and sanitation services, for example in India and Indonesia, have been found to be unsustainable (Eales et al. 2013; Reddy et al. 2013). However, the short history of how we think and talk about sanitation presented in this paper leaves room for optimism. It shows that the sanitation sector has learned much about the complexity of sanitation interventions during the last five decades, and that we are today better placed than ever to ensure sustainable sanitation services for all in the near future. The history also shows that new ideas and opportunities continue to arise. It can for example be expected that the role of small-scale service providers, co-production and the concept of environmental and long-term sustainable service provision will be explored in greater detail in the coming years. This may lead to new and interesting approaches to service delivery. However, what is also clear from the literature review is that integrating all available knowledge in practice and policy-making remains an unsolved challenge. In this section, it is suggested that the seven perspectives presented in this paper may afford a useful conceptual frame. This may help guide the thinking of practitioners, policy-makers and academics as they start tackling the sanitation related SDGs. Below are four specific examples of how the conceptual frame might support thinking.

**Sanitation services are more than infrastructure**

The seven perspectives presented in this paper provide a useful overview of how the notion of a sanitation service has transformed during the past five decades. During the Decade, the goal of ‘increasing service coverage’ was approached by expanding infrastructure. With the shift
towards appropriate technology, what was implemented changed and with it the idea of what constitutes a sanitation service. With the emergence of community-management and later the focus on private-sector involvement, the sector questioned who is better placed to provide and oversee services: the state, communities, or the private sector. When interest in governance and the inherently political nature of sanitation services increased, the question of how services could be provided and which political and institutional changes were needed was examined. Currently, the notion of a sanitation service is further transformed by the ‘sustainability of sanitation systems’ perspective. According to the FSM literature, the entire sanitation chain, including collection, transportation, treatment and reuse of human excreta must be planned for, and IRC suggests a larger focus on ongoing O&M (Verhagen & Carrasco 2015). As a result, while sanitation services previously were seen as equivalent to infrastructure, who delivers and how services are delivered is today considered as important as which technology is implemented.

As the sector begins to consider how to target the sanitation SDG, it can be valuable to keep in mind the breadth of knowledge available on the delivery of sanitation services. The short history presented in this paper provides a reminder of what has gone before and what sanitation services are, beyond technology. The historical overview will be particularly useful for people from various disciplinary backgrounds, many without prior knowledge of or experience with sanitation services, currently entering the sanitation sector. Especially within developing countries, as the focus on sanitation continues to increase, there has been a steady growth of government and aid sector staff engaging with sanitation. These stakeholders might benefit from the conceptual frame to guide their thinking and keep in mind the full history of how we think and talk about sanitation services.

New ways of measuring progress

While it is widely agreed that ongoing sanitation service provision relies on more than infrastructure, progress in sanitation is still mainly measured in terms of what Bartram (2008) describes as ‘haves and have-nots’. The JMP, who conduct the largest study on sanitation progress, base their statistics on the technology-based sanitation ladder and identify what percentage of the population in a given country have access to ‘improved sanitation’. The resulting data have been hugely influential, not least in advocating for increased funding for sanitation. Nonetheless, looking across the seven perspectives identified here, the data currently available leave us in the dark in several regards, for example in how services are governed and whether they are long-term or environmentally sustainable.

There is currently no indication that a change in approach to measuring sanitation progress is on its way, despite the wide recognition that sanitation services are more than technology. The Service Ladder introduced by Verhagen & Carrasco (2015) and the Function-Based Ladder by Kvannström et al. (2011), both suggest new ways of measuring sanitation, but neither have been widely tested or implemented in practice. Furthermore, while they both claim to be a move away from a technology-centred approach, neither takes into consideration many of the perspectives on sanitation services presented in this paper. As an example, neither look at aspects such as the quality of governance or the political salience of sanitation. The FSM Service Delivery Assessment Tool suggested by Peal et al. (2014b) does to some extent consider such aspects, as it looks at the quality of the enabling environment and the level of commitment to service sustainability. In its current form, the tool does not have sufficient detail to be scaled up and be useful for comparison on an international scale. However, the launch of the SDG affords a good opportunity for developing new ways of measuring sanitation progress that goes beyond technology. The seven perspectives presented in this paper may be a useful starting point for discussing how progress on sanitation can be measured post-2015.

Wider participation of sanitation service users

The literature review has made it clear that participation of sanitation service users has been a central part of sanitation interventions since the Decade. People, especially women, have been considered important in the selection of technologies. They have also taken part in implementing and paying for infrastructure, and their willingness-to-pay has been considered an important measure of demand.
awareness among citizens has furthermore been seen as key to the long-term success of sanitation interventions. However, looking across the seven perspectives, it is clear that sanitation service users have mainly participated by selecting technology and in terms of their financial contribution.

There are many ways service users can provide value in the delivery of services. While the literature extensively explores user preferences in terms of technology and willingness-to-pay, little research has looked at how users perceive other aspects of service delivery, such as how services are governed, and the political salience of sanitation or the sustainability of service provision (both long-term and environmental). Currently, such speculations are primarily the brainwork of academics and sector experts, while sanitation service users often have little to no say in how sanitation services are delivered other than through their vote at elections. If we truly believe in the importance of participation, we could promote user participation across all areas of service delivery. The conceptual frame presented in this paper provides a scaffold for considering how and at which stage users and their participation might provide value.

**New approaches to solving the funding challenge**

The short history of how we think and talk about sanitation services presented in this paper shows how the funding challenge has largely shaped the sanitation debate over the last five decades. Appropriate technologies were, for example, introduced as part of the ‘basic human needs’ perspective, partly to lower the cost of extending service coverage. Community-participation and community-management were seen as possible approaches to ensuring cost-recovery by increasing willingness to pay. Behind privatisation was the idea of utilising market mechanisms to fund the extension of service coverage, and the inherently political nature of sanitation was analysed and influenced to increase governmental interest and willingness to fund sanitation. More recent literature holds a renewed hope that funding issues can be overcome if FSM can turn wastewater into a resource (e.g. energy, building materials, or fertiliser). However, despite many attempts, the funding challenge has not yet been solved and it seems unlikely that it will be solved unless the various perspectives are combined.

The conceptual frame suggested in this paper can help guide thinking around specific challenges, such as the funding challenge. The seven perspectives provide a useful overview of the knowledge available and can assist practitioners, policy-makers and academics seeing the funding challenge from a more holistic perspective. The concept of appropriate technologies, for example, suggests that sanitation infrastructure is capital intensive, especially in the case of centralised systems. The perspective on community-management and community-participation reminds us that users can be a source of funding, but they can also prove unwilling to pay for sanitation, especially invisible components and treatment processes (Parkinson 2003; WSP 2011; Parkinson et al. 2014). For this reason, it also proved challenging to incentivise the private sector to take part in sanitation service provision. Therefore, sanitation services are today perceived by many as a public good, due to their monopolistic nature and potentially high positive health impact in society (Allen et al. 2008). The studies of the inherently political nature of sanitation remind us that sanitation has been perpetually under-prioritised financially in comparison to water. Political economy studies have shown that reasons include the often relatively low political incentives for prioritising sanitation as well as historical and cultural norms (BAPPENAS & WSP 2007; WSP 2011). Lastly, the current focus on sustainable sanitation systems reminds us that funding infrastructure alone is not sufficient to provide long-term service provision. Ongoing O&M and the full sanitation chain must also be fully funded (Verhagen & Carrasco 2015). Today 69% of investment in water and sanitation is spent on infrastructure implementation, but according to the United Nations, 75% is required for ongoing O&M (UN-Water & WHO 2012). By using the conceptual frame as a tool for exploring the funding challenge through seven different lenses, the challenge unfolds and its complexity becomes easier to understand. It also becomes evident that there is no one simple solution to the funding challenge. Rather than looking for ‘one size fits all’ solutions, the conceptual frame presented in this paper may be used as a foundation for discussing how available knowledge can be combined to develop more context-specific approaches to solving the funding challenge.
CONCLUSION

In this paper, seven perspectives on sanitation services were introduced. These were identified through a detailed review of 230 pieces of literature published during the last five decades. Sanitation became part of international development in the 1970s as the basic human needs perspective emerged. Sanitation services were considered public services and the responsibility of the state. With the appropriate technology perspective, low-cost technologies were introduced and service coverage rapidly extended. The community-participation and community-management perspective meant a change from supply-driven to demand-driven approaches, and responsibility for sanitation service provision moved from state to communities and households. The private-sector involvement perspective introduced privatisation to the sanitation sector and the crisis of governance perspective led to the development of various governance models such as the consumer-provider-regulator triangle and co-production. The inherently political perspective resulted in an increased understanding of the political incentives supporting or slowing progress in sanitation. Lastly, the sustainable sanitation system perspective is currently moving the sector beyond technology and promoting environmental as well as long-term sustainability of entire sanitation systems.

The seven perspectives offer a useful conceptual frame, which may guide the thinking of practitioners, policy-makers and academics working in the sanitation space. More specifically, the seven perspectives might be used as a foundation for developing new ways of measuring sanitation progress that goes beyond measures of access to technology; to explore wider participation of sanitation service users; and to examine the complexity of the funding challenge and explore new approaches to solving it. These are just some of the challenges to overcome before sustainably managed sanitation services will be available for all. As the sanitation sector begins to tackle the SDG sanitation goal, a good starting point is to ensure that policy-makers, practitioners and academics working in the sanitation sector keep in mind the breadth of available knowledge published over the past five decades, and actively use it to guide their thinking.

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