

Review Paper

Sanitation in developing countries: a review through a gender lens

E. Tilley, S. Bieri and P. Kohler

ABSTRACT

Sanitation has evolved from a purely technical discipline to one that includes social, environmental, economic and, increasingly, gender considerations. However, blurry notions of gender are frequently offered in the sanitation literature. Although it has been recognized that gender-responsive sanitation does not mean 'toilets for women', substantial alternatives are rarely debated. We structure our review of sanitation in developing countries along three lines: we start by fine-tuning the concept of gender both from the academic and the practitioner's perspective, analyse relevant developments in gender-specific policies and programming, and finally review the most appropriate toilet room and menstrual hygiene technologies. We argue that strategies to make technologies gender-responsive need to be based upon a thorough analysis of the social arrangements of the intimate, and how these are negotiated and institutionalized in a specific context. A lack of robust gender-segregated data on sanitation policies and technologies, along with reductionist framings of gender are to blame for limited progress in verifying the need for, and impact of, gender-responsive sanitation. Technology and policy development and implementation would benefit from gender-considerate interpretations of shame, dignity, safety and status. Further progress could be achieved by improving the translation process between different academic framings of the sanitation crisis.

Key words | appropriate technology, development, gender, menstrual hygiene management (MHM), sanitation

INTRODUCTION

While gender aspects of water, i.e. the roles and responsibilities related to the work of fetching, carrying, using and rationing it, have been well documented (Fisher 2006), the gender roles associated with purchasing, locating, building, cleaning, using and maintaining sanitation facilities are less clear.

Gender and sanitation is not new: pioneering studies at the International Water and Sanitation Centre (IRC) have promoted women and sanitation (Borba & Wildeboer 1997), and gender and sanitation (van Wijk-Sijbesma 1998) since the 1990s. As of late, an increasing number of experts have called for attention to the gender-specific needs and challenges relevant to achieving the Millennium Development

Goals (MDGs) (Tjon A Ten 2007; Brocklehurst & Bartram 2010).

While sanitation and questions of sexual difference are gaining traction in the media (Haviland 2009; Patchett 2010; *The Economist* 2010), academics have addressed menstrual hygiene, the impact of lacking sanitation on girls' schooling and economic aspects of constraining women's access to toilets, but often highlight the lack of robust data (Rydhagen 2002; Bapat & Agarwal 2003; Bharadwaj & Patkar 2004; Sommer 2009, 2010a, b; Reddy & Snehalatha 2011; Jasper *et al.* 2012).

In this review article, we provide insights into the field of sanitation and gender, and propose ways in which a

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gender-perspective in sanitation can challenge conventional views about ‘appropriate’ technology and address policy gaps for development cooperation. Furthermore, we hope to contribute to the debate by first assessing the explanatory potential of gender analysis in the sanitation sector; and second, by asking in what ways current gender concepts, debates and theory are challenged by the questions and problems specific to sanitation.

Following a brief overview of our review procedure (methodology), we introduce the concept of gender to the non-specialist and present a selection of the pertinent theoretical premises we consider useful for the debate on sanitation. The subsequent section summarizes the current state of gender-related policy among international and national NGOs, donors and government agencies with regards to sanitation in developing countries. Using a policy-cycle framework, we discuss both the official perspectives and third-party experiences of implementing genderized policy in the field.

Sanitation technology in developing countries is then reviewed. Technologies for menstrual hygiene and management (i.e. washing and disposal) are considered to be within the scope of sanitation technologies. We survey the options available and highlight the most pressing needs and priorities from a gender perspective – which, in this section, often, but not always, translates into a women’s perspective.

The foundations of gender theory and their current interpretations inform both policy design and the way it is interpreted; subsequently, donor and government policy influences technology choice and the ways in which technology is disseminated, targeted and implemented. Our review took this step-wise approach as a way of illustrating both the missing and existing interlinkages between the thematic areas which are essential to a holistic understanding of genderized sanitation.

In the final section, we synthesize our insights and propose thematic areas that should serve as the basis for further research.

REVIEW PROCEDURE

This review is mainly based on a systematic study of literature from academic sources, policy papers and reports. We

worked iteratively from key documents and gained material thematically, regionally, by institution, by author and by publication. Publications written in English and German were included in our search; seven of the documents included were in German. [Table 1](#) is a summary of the documents cited.

Though there is a dearth of peer-reviewed literature (evidence of the limited attention this topic has achieved), there is a wealth of unpublished documents (especially newsletters and reports) that show the commitment of NGOs and practitioners in attempting to highlight gendered approaches to sanitation.

Only documents that were specific to low- and middle-income countries (which we deemed to be developing in terms of sanitation) were included.

The conceptual considerations of gender include a selection of classic works and fundamental literature from gender studies, complemented by topical gender and development texts. Within this selection, the sociological and social science perspective was emphasized over the philosophical and epistemological, as the latter did not provide the most relevant summary of key gender concepts.

For the policy review, we began by compiling an extensive list of international, well-known organizations active in sanitation that had websites in English ([Table 2](#)).

The analysis followed a policy-cycle framework, using generally accepted/recognized stages: information gathering, initial consultation and data collection; policy design and development; policy implementation; policy operation and maintenance; and policy monitoring, analysis and evaluation (see, for example, [Keeley & Scoones 1999](#)). We derived the policy processes from a number of sources including the United Nations Economic and Social Commission for Asia

Table 1 | Types of literature reviewed

Document type	Number of citations
Academic journal articles	41
Reports	35
Books and book chapters	28
Electronic and Newspaper articles	14
Conference papers	4
Total	123

Table 2 | Agencies reviewed

Agency type	Agency
UN Agencies	Gender and Water Task Force UN Department of Economic and Social Affairs UN Development Programme UN-HABITAT UN-Water UN-Water Decade Programme on Capacity Development UNICEF
Development Banks	African Development Bank World Bank (Water and Sanitation Program)
International Development Agencies (International)	International Federation of Red Cross and Red Crescent Societies World Health Organization
International Development Agencies (National)	Australian Government Overseas Aid Program (AusAid) Canadian International Development Agency (CIDA) Swedish International Development Cooperation Agency (Sida) Swiss Agency for Development and Cooperation (SDC) Overseas development agency of the Catholic Church in Ireland (Trócaire) United States Agency for International Development (USAid)
Federal Governments	Government of India South Africa Department of Water and Forestry South African Department of Water and Sanitation
Research/Advocacy Institutes/Organizations	Institute of Development Studies Institute of Immigration and Development Studies Institute of Policy and Development International Food Policy Research Institute International Water and Sanitation Centre Overseas Development Institute Stockholm Environment Institute Sustainable Sanitation Alliance Water Engineering and Development
Non-Governmental Agencies	Catholic Agency for Overseas Development Christian Aid WaterAid Women in Europe for a Common Future

and the Pacific (UN ESCAP 2006) and the Overseas Development Institute (Court & Sutcliffe 2005).

Using the policy-cycle framework, a review of available reports, policies and case studies was conducted with the explicit goal of determining if and how gender was represented in any or all of the policy-cycle stages of sanitation policy produced by the agencies identified.

Only documents that specifically addressed sanitation were included in the review (i.e. the review did not include possible mentions of gender and sanitation in documents related to agriculture, migration, etc.).

CONCEPTUAL PREMISES FOR GENDER IN DEVELOPMENT RESEARCH

Counting women, although important, is not enough to address the gender question in any research field. It is, however, far less clear what exactly the gender perspective should encompass in relation to developing-country sanitation. In the following section, some of the basic principles of gender theory are outlined and discussed with respect to development research and, in a second step, sanitation.

If gender has undergone a remarkable career in development research and practice, the actual distance from its original theoretical and epistemological underpinnings is striking (Smyth 2007). We will not expand on the conceptual shifts of how women, and eventually gender, were introduced in development research and policy as this has been done elsewhere (Razavi & Miller 1995; Jackson & Pearson 1998; Young 2002; Bieri 2006). However, in order to avoid the buzzword-character that 'gender' has assumed in development research (Smyth 2007), we will emphasize the use of gender as a tool for thought (analysis) and for transformation (promoting change beyond a coping level) as advocated by Cornwall (2007b). This is far from the traditional 'add women and stir-perspective' (Harding 1995), which informed the 'Women in Development' (WID) approaches of the 1970s and 1980s (Boserup 1970), and which, although heavily criticized (Cornwall 2007a), remain influential.

The classic idea in gender theory was to separate 'sex' analytically as a biologically determined category from 'gender', which refers to the social interpretation of being a man or a woman. This interpretation is not arbitrary, but follows specific, often culturally negotiated and historically shaped codes and norms that are conveyed throughout the socialization process. As a research strategy, gender is an analytical lens through which people's actions and everyday practices, in the light of their belonging to, and identifying with, one sex, are interpreted. (Some of the current feminist theories question the exclusiveness of two biological categories and propose alternatives to the dichotomy of 'male' versus 'female'. We will not go into more detail on this since the relevance of this theorizing for development practice is debatable and far exceeds the scope of this article.) The aim is to find out in what ways the social fact of being a man or a woman influences peoples' actions, their decisions and, not least, their access to, or exclusion from, particular assets and spaces. As Saskia Sassen so eloquently stated: 'Categories are an invitation to stop thinking' (Sassen 2012). In other words, when we refer to individuals as 'men' or 'women' we unpack – or, to use the theoretical term, we de-construct – the social conditions of what this means in a specific context, with respect to social interaction, rules and norms. This analytical technique allows one to understand an individual's scope of action and, importantly, his or her

capabilities. Based upon a constructivist framework, gender research unsettles gendered attributions and stereotypes, analyses how they translate into everyday practice and, by extension, examines how they shape a person's capabilities within a specific power structure. This corresponds to recent calls to re-politicize the concept of gender, which has lost much of its edge in a process of bureaucratization and its mainstreaming as a technical tool, and to explore its potential as a critical instrument of analysis (Jackson 2006; Nightingale 2006; Leach 2007; Resurreccion & Elm-hirst 2008).

Drawing on the classic definition by Scott (1986), gender refers to an analytical category that questions arbitrary attributions of identity and asks for their premises and exclusions. As a historian, Scott was mainly referring to her own academic field and in that, the historical constructions of gender; in the next paragraph, we outline the implications and analytical potential of her approach with regard to sanitation.

A gender perspective on sanitation

If anything has been regulated by gender in everyday life – at least, but not exclusively in the public sphere – it is toilet use. Separate toilets for men and women are a prominent icon of sexual difference. So much so that one of the experts of everyday behaviour and a pioneer of social constructivism, Erving Goffman, built his argument of social interaction upon the institution of the ladies' and men's room. Contrary to the, then common, functionalist interpretation, which sees separate toilets for women and men as an *outcome* of sexual difference, Goffman argues for a reversal of the story. In his view, separate toilets – just like gender-specific shampoos, deodorants or bicycles – are not the outcome of a primordial difference between the sexes but a *means* of distinction in order to mark, maintain, justify and stabilize the gender difference in society. In other words, these everyday gender displays actually produce the very difference that seems to be their root cause (Goffman 2001). Behaving like a man or a woman is one of the prerequisites for becoming a respected member of society; it is so fundamental that we 'cannot not do gender' (West & Zimmermann 1987) – a well-researched, if understated fact.

Thus, going to the toilet is much more than relieving oneself. It is, just like buying deodorant or riding a bike, a staging of gendered codes: a cultural production of gender, a (sub-)conscious interpretation and performance – and therefore a reinforcement – of being male or female. ‘Doing gender’ (West & Zimmermann 1987; Kessler & McKenna 1992) extends to other parameters of social distinction that intersect with gender, such as status (class/caste), ethnicity, (dis)ability or generation. In this light, ‘gender becomes a powerful sealant for multiple dimensions of social inequality’ (Chari 2004; see also Crenshaw (1989) and McCall (2005)). We conclude then, that no matter how we conceptualize sexual difference, the bathroom break is clearly marked by it.

The analytical basis of gender theory was to separate sex and gender, though it increasingly became more deconstructivist, as exemplified by Butler (1990) and her contemporaries who seemed to remove all traces of the sexual body from the gender debate (The reaction to Butler’s theses (1991) and the disembodiment debate was very lively among German-speaking scholars, see Duden 1993; Lindemann 1993; Lorey 1993; all in the same special issue of ‘Feministische Studien’; Landweer 1994; Maihofer 1995. For summaries of the debate on gendered bodies in feminist theory see Villa (2006) and Duden (2010); in the English-speaking world, prominent critiques have been expressed by Nussbaum (1999) and Epstein (1995); as well as by Kirby (2005). In ‘bodies that matter’, Butler reacted to the critics by correcting the impression of dematerialized theorizing (1993).). As a result, the notion of gender became increasingly detached from the body. Looking at sanitation through a gender lens brings aspects of the body back into the debate and challenges more abstract, disembodied gender concepts. In this regard, not only will sanitation benefit from a gender analysis, but gender theory also stands much to gain by addressing questions of sanitation.

De-naturalizing the natural

How we think about bodies and organs, substances and processes, is determined by, but not reducible to, their social and cultural meanings, a fact which clearly and significantly contributes to addressing sanitation needs (Jacobs & Nash 2003). However, we will hopefully

demonstrate that within sanitation and its focus on what seem to be very basic elements of a gendered existence, lies an analytic potential for addressing power relations and structural asymmetries. Clearly sanitation has much to contribute to addressing practical gender needs – such as disposal technologies for menstrual pads (Molyneux 1985). However, strategic gender interests may be equally at play – and in that a more transformative approach. The research by Fatima Sultana on gender and water pollution in Bangladesh (Sultana 2009), presents an analysis on the intertwining of body functions, material conditions and gender as they unsettle family life and traditional power relations. In what is a paradoxical ethnography of de-naturalizing the natural (though highly tabooed), she demonstrates how women and, in fact, entire households negotiate between safeguarding the family honour and taking the risk of negative health impacts as they drink unsafe water. This trade-off results in longer journeys for the women to fetch water from non-polluted sources, a condition which conflicts with the socio-spatial norms of *purdah*, a practice of seclusion mostly practiced by the Muslim community in Bangladesh, but also adopted by Hindu families in India. It restricts women’s mobility in public spaces and operates by way of strictly separating women and men’s spaces. Protecting women from feeling exposed and vulnerable because of their intimate needs requires an interdisciplinary approach to bring about a result that is both ‘technically appropriate and socially acceptable’ (Nawaz *et al.* 2010). The goal should be for all family members – women and men – to feel as comfortable as possible as they practice their daily hygiene. This involves integrated, participatory and possibly gender-synchronized (Greene & Levack 2010) planning that addresses not only toilets but also washing and bathing units as well as the layout and topography that influence the exposure of the sanitary facility to prohibited looks (Nawaz *et al.* 2010).

Gender-responsive sanitation goes beyond asking women for their preferences, having them represented in planning committees or providing them with sanitary pads and tampons. The gender approach, as we propose it, offers an instrument to re-read intimate needs as socially intertwined and culturally embedded. This has been confirmed by some of the more successful planning

approaches, such as Community-Led Total Sanitation (CLTS) (Kar & Chambers 2008; Chambers 2009), which are praised throughout the development community, although they lack long-term technical and social results (Movik & Mehta 2010). ‘A fine-tuning of measures’, Sijbesma & Postma (2008) conclude, needs to replace a one-size-fits-all strategy. To genderize sanitation, as we understand it, is part of this fine-tuning. We argue that a gender-responsive approach to sanitation could address the needs and preferences of a greater variety of users (not just women), create spaces to bring the unspeakable to the fore without exposing individuals and rendering them vulnerable, and make interventions more acceptable to the community as a whole. To use gender as a tool for thought and for transformation (Cornwall 2007b), as suggested above, combines the analytic scrutiny with transformative elements. The translation of this concept into specific policies and technologies is risky, since implementation often boils down to quick fix solutions for women only, deliberately refraining from any transformative claim. It is one of the challenges that gender research addresses, and we hope to stimulate this debate by highlighting how gender relations play out in the search for, and implementation of, adequate sanitation solutions. In the following sections we review some positive and negative examples of how this has been implemented in the developing world.

SANITATION POLICY AND PROGRAMMING

In this section we explore whether and/or how selected implementing organizations, governments and donors have incorporated gender, and to what extent it has been applied as a genuine tool for improved analysis and sanitation service delivery. In general, very few agencies (save for, e.g. The World Bank) provided clear guidance on integrating gender into sanitation projects and provided dedicated materials (e.g. checklists, indicators or measureable targets). The majority of the literature reviewed included implicit mentions of ‘gender’, though more commonly referred to ‘women’, and was rarely presented in a structured manner (fitting to the policy cycle or otherwise). Most documents were more conceptual than concrete; they spoke broadly

about the inclusion of women rather than of a gendered approach. The WHO uses all-encompassing language: ‘ensuring that the needs and aspirations of all groups are considered’ (WHO 2004), while UN-Water explicitly states that to effectively consider and include all consumers in sanitation policy, it is necessary to analyse the target group from a gender perspective (Interagency Task Force on Gender and Water (GWTF) 2006).

Not surprisingly, organizations reviewed began to include a gender component in their mission statement or mandate in the mid- to late-1990s (see for example, Murphy 1995; UN 1995a,b, 1997; World Bank 1995; UN-Habitat 1996; IFRC 1999; WHO 2002). This coincides roughly with the International Conference on Water and the Environment in Dublin (January 1992) at which the role of women in water management was officially recognized. Another advancement came from the Johannesburg Plan of Implementation (paragraph 25) at the 2002 Earth Summit and the resolution establishing the International Decade for Action, or ‘Water for Life’ (2005–2015), which calls for women’s participation and involvement in water-related development efforts (GWTF 2006).

Disaggregated data has been shown to be useful for understanding differences across and between groups, especially during the consultation stage (AusAID 2000). The Red Cross (IFRC) emphasizes that data collection, analysis and reporting should strive for a balanced representation of any potentially vulnerable or marginalized groups (IFRC 2011); a recommendation which goes beyond counting women, but, even if laying the basis for a truly gendered understanding, does not include a transformative perspective.

Outcomes from a variety of successful community WASH projects pointed to the conclusion that ‘Women have the best local knowledge about common habits and any problems stemming from them’ (Fisher 2006). This type of formulation would best be replaced with one that appreciates the different types of knowledge that men and women possess, and emphasizes the need to understand the similarities and differences of using a gender-responsive method. The IRC’s inclusive approach recognizes that the needs and interests of men and women differ considerably, and that these interests have important implications for the performance of the sector and beyond (IRC 1995). With regards to reproductive health, a recent publication

by the interagency gender working group proposes a gender-synchronized approach to highlight the necessity of including both men and women in transformative programmes (Greene & Levack 2010). A truly gendered approach to goal-setting would create a framework for cooperation between all stakeholders in order to ensure that the insights and concerns of all groups are available to shape programmes and meet sector objectives (Rop 2010).

The operational level is one of the most important steps for gender in sanitation policy because decisions made at this stage shape engagement with communities (Rop 2010). These activities have the ability to empower marginalized stakeholders by giving them authority in communities to become leaders and decision-makers for sanitation issues. In this way, the policy results become more sustainable when the community is sharing ideas and experiences with the programme planners (IRC 1995). Empowerment will, however, only be realized if everyone's roles are defined within communities so that the most effective (and not the most traditional) leadership structures are developed. In identifying roles, some of which may not had been recognized (e.g. that of cleaning by women, or maintenance by men) are acknowledged. When roles are defined and enforced, incentives to invest time or effort in the operation and/or maintenance of systems are created (Rop 2010).

Policy implementation should result in evident changes on the ground and among stakeholders; the results of these policies however, were not found and are possibly lacking. Top-down policies, especially when they are not enforceable inspire little buy-in, especially as reporting requirements become ever more intensive. Gender is mostly seen as a 'nice to have' rather than a 'need to do' aspect; short time-frames and budget limitations add to this perception. Furthermore, a lack of dedicated funding (i.e. for monitoring or impact evaluations) makes data generation even more difficult; the effects of a gender policy are not easily quantified, especially over the short-term, thus making data collection and presentation even more elusive. To formalize monitoring, a gender-balanced, community oversight role using gender sensitive indicators should be implemented (AusAID 2000; Rop 2010). This would mean developing metrics as well as qualitative indicators to gauge the effect of the policy or programme (negative or positive) with regards to gendered outcomes. Ideally, communities would

experience a more uniform level of access and satisfaction with both the policy process and the outcome of the programme. Standard monitoring procedures, as they figure in most log-frames, may fall short of capturing non-obvious or more nuanced aspects of change. Broadening the scope, proposed monitoring and evaluation mechanisms could be aligned to measure the impact that gender-responsive programmes have in achieving progress towards the UN's MDGs (UN-Habitat 2006). Also, in order to capture the medium-term effects of sanitation initiatives on diverse target groups and on their general well-being, methodological innovation is needed.

Outlook

It is revealing that the documents discussed in this section are primarily those issued by donors and agencies responsible for *overseeing* implementation. It appears, then, that the inclusion of gender is a mostly donor-driven requirement, recommended for integration, but without an obvious degree of enthusiasm from those towards whom it is directed. There are few documented instances of how revised policy has translated into improved outcomes. The relative lack of clear and enforceable policies means that we found no instances of gender-considerate guidelines that were rigorously documented over the policy-cycle stages. Indeed, it appears that although there are different instances of policy-cycle steps being put into practice (e.g. initial consultation and data collection), there is no continuity, i.e. information does not flow between stages but is found, or is generated, when needed. The policy cycle exists to shift and transform information into the next logical phase upon which it can be built. Precisely because gender-considerate sanitation policy has not been tracked continuously, we are left with an absence of data; data that is needed to help explain what policies or at what steps those policies succeed or fail. Furthermore, a translation process between policy writers and policy implementers must be improved to put these findings into effective practice. Not least, a solid commitment by the top management of the agencies is crucial for putting effective, transformative policies in place.

This review has shown that there is abundant well-worded, well-intentioned gender-conscious policy

representing various stages of the policy cycle, yet very little evidence showing that it has been adopted, or that it has had any impact. Paradoxically, once identified, this ‘implementation failure’ seems to put pressure on agencies which results in even more programmatic statements relating to the importance of gender (Leach *et al.* 2010). Nevertheless, we find little evidence of a truly gendered approach to sanitation. Instead, emphasis is put on women, or more broadly on equity, sometimes equality; few metrics are presented, and if balance between men and women in planning and users’ committees seems to be of primary concern, transformative functionings are not.

TECHNOLOGY

Our review of technology brings us to physiology: women urinate in a way that is very different from men and, considering that women spend approximately 2,100 days or 6 years of their lives menstruating (UNICEF 2008), different technological requirements – in the sense of practical gender needs (Molyneux 1985) – are obviously important. Horrific stories about violence that occurs as a result of walking long distances to a public toilet (Amnesty International 2010), the onset of infections from inadequate washing facilities (Kirk & Sommer 2006; Maimaiti & Siebert 2009) or ill-health and dehydration as a result of suppressing the urge to drink and waiting to urinate at night (Fisher 2006) are commonly used arguments for why women should have improved sanitation in developing countries. However, there are not robust data to support the connection between menstrual hygiene management and reproductive tract infections (RTIs) (Hygiene Centre at the London School of Hygiene and Tropical Medicine *et al.* 2012). Similarly, the notion that girls do not attend school because of a lack of sanitation is pervasive though based on little evidence (Tjon A Ten 2007; Economist 2010; UNICEF & WHO 2010). Though there are some studies (Wilson *et al.* 2012) to support many of the anecdotes, they are limited and still there are some data to the contrary (Oster & Thornton 2009). More nuanced work points to a variety of structural factors preventing school attendance (Sommer 2012).

To analyse the current state of knowledge and progress, we differentiate between toilet room technologies

(primarily, though not exclusively, for urination and defecation), maintenance and menstrual hygiene technologies. We reject the word ‘latrine’ or ‘WC’ on the grounds that there is no universal definition for either. And although the word ‘toilet’ is not descriptive enough to encompass the range of pans, slabs and pedestals into which urination and defecation occurs, it is a commonly accepted term. The ‘toilet room’ therefore, is taken here to be the location where the toilet is located and will be used throughout the text (Tilley *et al.* 2008).

Using these categories, we critically review the currently available information about best practices and experiences when taking a gendered approach to sanitation.

Toilet room technologies

Embarrassment and shame are strong emotions associated with defecation, and the risk of being stigmatized as a result of inadequate hygiene is very real and exacerbates the marginalization of the poorest (Dyalchand *et al.* 2011). Note also that since the process of getting to or away from a toilet can be physically dangerous or psychologically trying, the location of the toilet and a spatial perspective in a more broad sense are equally important as the type and quality of the facility (Nawaz *et al.* 2010; O’Reilly 2012). Within a cubicle, there should be, at the very least, a garbage can, a toilet brush (for removing markings) and water (Deegener *et al.* 2009). A garbage can is needed so that the user needn’t put soiled materials in the toilet or be forced to carry them in his/her pockets, which could draw attention and shame (WaterAid 2009a). Water is required for both hand and body washing (ideally with a room for intimate washing) and it should be available within the toilet room so that others cannot see a toilet user carrying water and thus know that he or she requires washing (e.g. during menstruation). The seemingly obvious practice of providing separate boys and girls toilets resulted in increased girls’ school attendance by 11% a year (Interagency Task Force on Gender and Water 2006) and the government of Nepal will invest more than 1 billion rupees for ‘separate toilets’ to ensure privacy and safe spaces for hygiene practices (Forum for Urban Water and Sanitation 2011). In India, not only are there more public toilets for men (5,993 for men vs. 3,536 for women), but

women, unlike men, must pay to urinate: decreased access at an increased cost (Yardley 2012).

Despite a steady shift towards user-driven sanitation planning (Lüthi *et al.* 2008), user feedback and participation in the design process is not necessarily a guarantor of success. In rural Rajasthan (India) a development project was meant to improve the burden of sanitation on women. Toilets were placed within the family courtyard, a seemingly improved situation for women who would no longer need to walk to off-site facilities. However, the ironic outcome was against women's strategic interests: they lost the freedom to travel away from home to defecate and to dispose privately of the menstrual material far from the house; the male-selected courtyard toilets removed all of these liberties and safety mechanisms (O'Reilly 2010). O'Reilly's study indicates that for women and men to be entirely included, they must be included in the sense that the possibility exists for everyone to have their voice heard (this could, paradoxically, require segregation during the planning process). Another important lesson to be drawn from O'Reilly's findings is that private toilets might not be the ultimate aim as cultural norms impose taboos on toilet use between in-laws, as reported from African contexts (Musyoki 2010). Women-focused projects, as illustrated, often lack a truly gendered understanding of the context – one which would have resulted in a process to identify technologies that considered gender relations. Community solutions or dedicated toilet and washing units for women might be far more adequate and empowering.

Maintenance and operation

Widely seen as the most convenient solution, the Western standard, the flush toilet is as much desired as it is unattainable for the larger part of the world's population (Black & Fawcett 2008). Namely, in the global South, water is often scarce and a connection to a sewer pipe is rare (WHO & UNICEF 2010). Therefore, most sanitation technologies in developing countries are based on the principles of collection and storage. Despite the fact that the practice is banned, millions of people work as manual scavengers in India (80% of whom are women), scraping and carrying the excreta which piles up on public and private dry toilets (Naa Lamiley Bentil 2009;

WaterAid 2009b). Some have argued that because women are primarily responsible for water-fetching and emptying, waterless or 'Ecosan' technologies (e.g. a urine-diverting dry toilet) are more suitable in that technologies of this type require less operation and maintenance (Dankelman *et al.* 2009).

The role of women in technology maintenance, however, must not necessarily be oppressive. Examples indicate that economic incentives might prove successful in addressing a double target: the maintenance of water and sanitation facilities and the (economic) empowerment of women. In 2003–2004, the eThekweni Municipality (South Africa) funded a pilot project to employ pit-emptiers. Whenever possible, women were hired and paid ZAR 60 (US \$10) per 9-hour day of work. The project organizers expected resistance, but because unemployment was so high, applicants turned out in great numbers and the women hired were found to be conscientious and hardworking despite the difficult working conditions (Eales 2005). Similarly, women who were employed as local latrine builders in Nepal not only reaped economic benefits (money, which was used to buy food and pay for schooling) but were found to have increased dignity, honour and a high standing within their communities (Prajapati *et al.* 2009). Since only women can approach unchaperoned women in Afghanistan, and since most women are home alone during the day, a 75% increase in revenue materialized when female meter-readers (for water connections) were hired to assess and collect payment: a simple case of genderized service provision (USAID 2010). More research is needed to explore the economic value of sanitation and waste, to assess strategies to involve both women and men, and to document the effects of these initiatives on women's livelihoods and their well-being more broadly, as well as the prospect of up-scaling and transferring such measures to different regions of the developing world.

Menstrual hygiene management (MHM)

Though various definitions of MHM have been offered (Hygiene Centre at the London School of Hygiene and Tropical Medicine *et al.* 2012) it is clear that within the realm of WASH, MHM has been identified as one of the most neglected aspects (Mahon & Fernandes 2010). There is a slow

but steady top-level awareness of the problem (Kirk & Sommer 2006; Brocklehurst & Bartram 2010), though the sensitive nature of the issue means that action and implementation has lagged behind. MHM occurs both inside the toilet room and also wherever adequate privacy and hygienic conditions can be found. Perhaps because it is not conveniently bound to a single, observable behaviour, outcome or piece of infrastructure, menstrual management evades easy definition, and therefore responsibility. The long-time neglect probably refers to the fact that, until recently, sanitation engineering has been largely an area of male expertise. Exacerbating the difficulty of providing adequate services in the toilet room is the fact that practices and preferences vary widely from woman to woman and from country to country (Bharadwaj & Patkar 2004). The practice of 'chhaupadi' or the confinement of a woman during her period to a cow shed (owing to her perceived uncleanness and bad luck) was outlawed by Nepal's Supreme Court in 2005, but deep-rooted beliefs mean it still persists (Sharma 2005; Haviland 2009).

A discussion of menstrual hygiene may appear to regress back to a discussion of 'sanitation for women', but, in fact, the various norms and taboos that surround menstruation must be negotiated by all members of society; exactly why it requires genuine gender-responsive consideration.

Menstruation management technologies (MMT)

Though difficult to prove, the use of cloth rags to absorb menstrual blood is likely the most common technology for MHM because the factory-produced sanitary napkins used in industrialized countries are too expensive for most women in the developing world. A study of 380 women in India found that over 97% were using old cloth (Garg *et al.* 2001) and three out of four women surveyed for a study in Nepal said that they used re-usable material because they could not afford single-use pads (WaterAid 2009a,b). As discussed in the following section, reusable MMTs must be washed and dried, lest they harbour bacteria and smell. To avoid this water-dependent, labour-intensive and often shameful practice, several alternatives have been proposed.

The 'Duet' is a reusable, polyurethane diaphragm-like device, worn internally, that is used to collect menstrual

blood. It was tested with women in Zimbabwe and although it is more expensive to buy initially, it is free to use after and may therefore be attractive to poor women (Averbach *et al.* 2009). Similarly, the silicone 'MoonCup' was tested with 101 girls in Nepal. There, it was the girls who work for pay or report spending a lot of time washing menstrual cloths who were the most likely to use the technology (Oster & Thornton 2009). Because it is widely believed that internally worn MMTs (e.g. collection cups or tampons) may indicate the loss of virginity (Goodyear-Smith & Laidlaw 1998), the acceptance of such products will depend greatly on the cultural context. Furthermore, such cups must be washed thoroughly, and therefore an adequate water supply and soap are required; unclean cups or hands could introduce infections when the cup is inserted. These types of products have been available in Europe and North America for at least two decades, but users report various degrees of satisfaction, and still the product maintains a small market share (Cheng *et al.* 1995; Howard *et al.* 2011; North & Oldham 2011).

The provision of high-quality, low-cost MMT is particularly important for women with limited resources (both time and money), but the product itself is still just one aspect of menstrual hygiene.

Access and distribution

Access to MMTs is limited due to cultural barriers, poor awareness of alternatives (Fakhri *et al.* 2012) and high cost (including taxes) (Radio New Zealand International 2012). Although more products are becoming available for purchase, access is not guaranteed. Though we question the accuracy of the data, a recent article by Craig (2012) points to the extremes that some women will go to in obtaining MMTs.

In some contexts, women are not able to purchase MMTs from male store clerks; asking questions or getting a demonstration is even less likely. With low (perceived) demand, vendors are hesitant to stock a suitable selection and may eventually discontinue the product (Mahon & Fernandes 2010). Sanitation stores or 'Sani Marts' have been opened in Bangladesh and are staffed by women, so women could safely and comfortably purchase menstrual

hygiene products and discuss issues about menstruation (Nahar & Ahmed 2006). Access to MMTs during disasters is an even more pressing challenge in emergency relief (Wickramasinghe 2012).

To overcome the price barrier, there have been a variety of initiatives to develop menstrual hygiene products: the 'Makapad' developed at Makerere University (Uganda), is made of local papyrus (UN-Habitat 2005; Nahar & Ahmed 2006), while an NGO in Rwanda is promoting self-made banana-leaf pads (Viladas 2010). A project led by BRAC, an NGO, in Bangladesh employs women and girls to make sanitary napkins with gauze and cotton with a small profit going to the seller (Bharadwaj & Patkar 2004). Not only do projects such as these improve access for consumers, but they also provide employment and skills training. Procter & Gamble inaugurated the 'Protecting Futures' campaign in 2007, which aims to build toilets, educate teachers and distribute free pads to schoolgirls in Africa, though the sustainability of such a hand-out programme has been questioned (Deutsch 2007). Technology innovation to lower costs or subsidize raw materials would maintain cottage industries and the use of local resources. Regardless of the product, the expansion of the disposable product market must develop concurrently with the expansion of appropriate disposal technologies.

Disposal technology

On average, each woman will dispose of 125–150 kg of tampons/pads in her lifetime; in the developing world many end up in waterways, open dumps or littering communities (Bharadwaj & Patkar 2004). Common practices, when there is no garbage can, include burying, burning or using a toilet – despite the risk of clogging (WaterAid 2009a,b). Women from a slum in Delhi reported that burying the cloth prevented witchcraft, but because of the density of the slum, the cloths were most often thrown into pits (Garg *et al.* 2001). Composting pits for used sanitary pads (with added cow dung to speed up the digestion) have been piloted (Nahar & Ahmed 2006) and there has been some success with worm composting (Bharadwaj & Patkar 2004), though robust data are still lacking.

Incinerators connected directly to the toilet room are a discrete and effective way of disposing of MMTs. They

have been piloted in India and were widely lauded (Bharadwaj & Patkar 2004; Nahar & Ahmed 2006) though a lack of mason training, poor designs and insufficient operation and maintenance have resulted in negative experiences (Mahon & Fernandes 2010) and a growing backlash against the technology itself, which is also related to the emissions (Global Alliance for Incinerator Alternatives 2010).

Washing and drying technology

In the absence of disposable products, women must wash and dry cloths; a difficult task that requires water, the need to dispose of the bloodied water and the need for a suitably dry and preferably sunlit location in which to dry the rags. In Pakistan, hygiene units where women could wash and dry menstrual cloths were constructed in a way that prevented anyone from seeing either blood-coloured water or the drying towels (Nawaz *et al.* 2010). A survey of 193 women in Nepal found that washing and drying a 're-usable absorbent material' was said to be practiced 'outside house with sunlight' only 59.8% of the time and that the cloths were usually covered (WaterAid 2009a,b). Adolescent women in Bangladesh reported rashes and infections because they were using still-damp rags as they had no place to dry them (Nahar & Ahmed 2006).

Outlook

Sanitation is not merely a challenge for more or better toilets. The toilet is but one crucial element of a facility for personal hygiene, and local populations may judge the quality of sanitation provision differently than by the standards of the (Western-biased) quality or type of toilet. Gender-responsive facilities are those which not only serve the physical requirements of women and men, but ones which consider the social norms regulating intimate needs and translate these into a sanitation architecture which factors in the spatial situation, accounts for gender specific constraints with respect to mobility and exposure and offers more than one function (i.e. urinating/defecating). The reaction of users to the technology and towards each other as well as the broader context of how, where, with whom and by what means the technology is planned and

implemented is fundamental (Lüthi *et al.* 2008; Nawaz *et al.* 2010). A well-constructed toilet is not adequate if it causes fear, shame, disgust or exclusion and methods must be developed to consider these factors beyond basic utility and towards a gender-transformative sanitation policy.

CONCLUSIONS AND RECOMMENDATIONS

In this article we aimed to (a) provide the reader with a clear understanding of gender, away from the buzzword status that it has acquired, (b) review the existing and highlight the missing literature, (c) broaden the range of what needs to be considered in an analysis of gender-responsive sanitation, and; (d) generate interest and direct focus towards the complex aspects of sanitation in developing countries as seen from a gender perspective. This perspective, we hope, will generate new insights and potentially innovative pathways to address the sanitation crisis. While we have argued that sanitation could benefit from a genderized analysis, it should be noted that the debate on gender and sanitation will equally feed into gender studies and contribute to gender and development theorizing and policy.

Our review led us to identify three reasons why gender questions, despite early initiatives, have not permeated the sanitation community in a broad sense and we offer recommendations about how they could be addressed. First of all, the quest for behaviour change in sanitation research ultimately frames intimate needs as an individual problem. Downplayed as ‘implementation failures’ (Leach *et al.* 2010), poor outcomes point to the insufficient understanding of the social character of intimate needs and practices. Strategies to improve technologies and make them gender-responsive need to be based upon a thorough analysis of the social and institutional arrangements of the intimate, and how these are negotiated in a specific context and at different scales (community/household). This includes scrutiny of the intimate as a social issue and its regulation by explicit and implicit power relations. Sanitation provision necessarily includes a debate about rights and responsibilities (for both governments and citizens), and this can only happen once it is recognized that sanitation does not rest solely in the private domain, but is a part of a broader social fabric and must be treated as such.

Secondly, pressed by the result-driven policies of aid effectiveness and the MDGs, quantitative indicators have crowded out quality measures or disregarded them as ‘anecdotal’. Qualitative indicators tend to be more costly to survey, and they add to the complexity and budget of a project. Given the delicate nature of human excretion, the methodological challenge to elicit sensitive information is obvious. The present lack of data supporting the need for the adoption of gender-responsive policies and programming provides little incentive for agencies to adopt funder policies – policies which are largely viewed as being imposed at the inconvenience of the implementer. For agencies and researchers working in sanitation, gender is sometimes viewed as an extra cost – both financially and in terms of time; a cost that is not always seen as justifiable. There is a need then to demonstrate how and why a gendered approach to sanitation is economical (improved usage, better health, school attendance, etc.) and how to translate that need into non-vague terms: terms which go beyond ‘nice to have’. The taboo nature of sanitation in many cultures means that the information needed to assess and understand these linkages, and to distinguish between different preferences is difficult to obtain. For that reason, innovation in methodologies and data collection will be needed.

Cultural and social (gender) norms and the respective power relations dictate the lengths to which women will travel (to be hidden), go thirsty (to avoid a public latrine) or be ingenious (in the way they change or hide menstrual management technologies). Any technology will be used, not used or adapted, based on the level of dignity it provides. Sanitation provision has classically been seen as a technical problem, to which there is an engineered solution. Engineers have made remarkable progress over the years in broadening their approaches, but further advancement will be aided immensely if the social sciences, engineering and policy-development communities (at the research and practical scales) engage in a genuine translation process between disciplines and within their own to understand different framings (Leach *et al.* 2010) of sanitation and their implications on the fulfilment of intimate needs. Gender-considerate interpretations of shame, dignity, safety and status need to feed into the technology debate. It is also a sense of dignity and shame, ironically, which prevents us,

as researchers, engineers and policy makers from addressing the realities of sanitation: the words ‘urine’ and ‘shit’ have been taken off the taboo list (Black & Fawcett 2008; George 2008; Mehta & Movik 2010), but ‘menstrual hygiene’ is still largely absent from the sanitation vocabulary. This can only be rectified by improved inter- and transdisciplinary work to identify different framings of the problem and to define complementary and transformative research methods and forms of collaboration.

Precisely because sanitation is so hands-on, material and visceral, its potential for addressing not only practical, but also strategic gender interests and offering pathways to empowerment and eventually inducing social change has been underestimated. We hope that by providing entry-points for a gender-transformative approach to sanitation we have helped to illuminate some of the potential pathways to achieving not only improved sanitation, but improved sanitation for all.

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