

Sarah Jewitt

University of Nottingham, UK

School of Geography, University of Nottingham, University Park, Nottingham NG7 2RD,
UK Email: sarah.jewitt@nottingham.ac.uk

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**Geographies of Shit: Spatial and temporal variations in attitudes towards human waste.
Abstract**

Taboos surrounding human waste have resulted in a lack of attention to spatial inequalities in access to sanitation and the consequences of this for human, environmental and economic health. This paper explores spaces where urgent environmental health imperatives intersect with deeply entrenched cultural norms surrounding human waste and the barriers they create for the development of more appropriate excreta management systems. The primary focus is on the global South (particularly India), although literature on sanitation histories in Europe and its colonies is drawn upon to illustrate spatial and temporal differences in cultural attitudes towards excrement.

Keywords

Global South, human waste, India, sanitation, taboo

I Introduction

According to Stephen Turner, the former Policy Director of WaterAid, the need to address and enhance understandings of global sanitation problems means that “we need to put the word shit into people’s mouths” (quoted in Sanitation Now, 2008: 2). In an attempt to draw attention to the 2.6 billion people lacking access to “improved sanitation” and highlight how this “hidden global scandal constitutes an affront to human dignity on a massive scale” (UN, 2008c), the UN General Assembly declared 2008 as the International Year of Sanitation. This initiative was also part of an effort to accelerate progress towards Millennium Development Goal 7, Target 10 (access to safe water and basic sanitation) that seeks, by 2015, to reduce by half the 2.6 billion people without access to basic sanitation. According to the United Nations, without “improving sanitation, none of the other Millennium Development Goals, to which the world has committed itself, will be achieved” (UN, 2008b).

As a result of the “great distaste” surrounding shit (Black and Fawcett, 2008: 138) however, the impacts of inadequate sanitation on human health have been severely neglected, or conflated with water as part of broader (and less distasteful) “watsan” initiatives.¹ Sanitation was only added to Target 10 following lobbying at the 2002 World Summit on Sustainable Development in Johannesburg and charitable appeals concerned with “unsafe water” often fail to mention “the real culprits – shit and the lack of sanitation” (ibid 73).²

Sanitation is further marginalised by the absence of a “threat from below” (of disease and social revolution) in the global South today comparable to that associated with nineteenth century sanitary reform in the UK (Chapman, 1999; Gandy, 2008). Close associations between crime, immorality and unsanitary conditions were important drivers of sanitation reform within Britain and its colonies (McFarlane, 2008b). Following the 1857 mutiny in India, the threat of rebellion as well as the spread of disease and odours from overcrowded slums provided an important impetus to sanitation improvements in Bombay (Gandy 2008). Parallel improvements in the twenty first century have been slow to materialise and a report by the House of Commons International Development Committee (2007) estimated that at

current rates of progress, the MDG sanitation target will not be met until 2076; a situation described as “a hidden international scandal that is killing millions of children every year”.³ Black and Fawcett argue that in order for sanitation to be a central item on decision makers’ agendas it is important that the “squeamishness that surrounds the subject with silence and taboo is tackled head on ... today’s sanitary crisis requires that we dismantle the last great taboo, and learn to talk about ... shit” (Black and Fawcett, 2008: 10).

Wider problems hindering the development of solutions to inadequate sanitation include inappropriate, top down sanitation interventions that prioritise “hardware” and neglect wider political ecologies and “software” (socio-economic, cultural) dimensions.⁴ This in turn has helped to prevent a thorough analysis of why different sanitation systems succeed or fail in different cultural contexts. Another problem has been an “absence of academic curiosity” (George, 2008: 151) about toilet habits. Srinivas (1992: 369) argues that although “defecation and self-cleaning, like procreation and food consumption, are an inextricable part of the human condition”, toilet styles and behaviour have “received far too little attention as a research topic, and observations of social practices are few”. Notable exceptions include Kira’s (1976) study of bathroom design plus research (focused primarily on the global North) on toilets as gendered public spaces (Foucault, 1977; Lefebvre, 1974; Banks, 1990; Cavanagh and Ware, 1991; Kristeva, 1996; Edwards and McKie, 1997; Cooper et al, 2000; Daley, 2000; Greed, 2003; Cowen et al, 2005; Penner, 2005; Gershenson and Penner, 2009).

This paper examines the impacts of spatial inequalities in access to sanitation and the consequences of this for wider human, environmental and economic health in different regions. Geographical research on sanitation and urban metabolism (Swyngedouw et al, 2002; Gandy, 2004; 2005; Swyngedouw 2004: 2006) has highlighted the need for more place-sensitive and participatory approaches to the management and use of human excrement that are sensitive to local culture, socio-economic status, political ecology and physical environments (O’Hara, et al, 2007; Gandy, 2008; McFarlane, 2008a; 2008b).

Although faeces have formed only a minor part of my own field research in the global South thus far, I have been fascinated and horrified in fairly equal measure by the deeply embedded taboos surrounding human waste and the environmental health problems resulting from a lack of effective excrement management systems in many parts of the Indian subcontinent. When undertaking fieldwork in India, I was shocked by the social (and economic) ostracism suffered by those Indian Scheduled Castes responsible for the removal of human excrement from public and private latrines (Srinivas, 2002; Ramaswamy, 2005). I was also astonished by the lack of awareness of faecal health risks amongst many rural households with above average income and education levels. Research on agrarian change which revealed significant gendered competition over animal dung (for household energy and agricultural manure) in northern India (Jewitt and Baker, 2006; Baker and Jewitt, 2007) intrigued me further in terms of the very different levels of disgust and taboo (quite the opposite in many cases)⁵ associated with cattle and human excrement.

This encouraged me to explore the literature on how urgent environmental health imperatives intersect with entrenched cultural norms and powerful emotions surrounding human excrement in different geographical contexts. I was also interested in how deeply embedded taboos surrounding human faeces have often (but not always, and not everywhere) created barriers to the development of more effective and/or sustainable excreta management systems. Some of the findings from this literature review are presented here along with insights gained from recent preliminary fieldwork in India regarding local attitudes towards human shit as a source of energy and fertilizer. Although excrement-related taboos and the need for more effective/sustainable ways of managing human waste are both fairly universal, the paper will focus primarily on the global South⁶ where the environmental health implications of ineffective shit-management systems are most profound (Jewitt, 2010).

Literature on the history of sanitation and use/management of human waste in Europe and its colonies is also drawn upon to illustrate how cultural attitudes towards shit have changed over time and space.

II Temporal and spatial variations in the “great distaste”

As theoretical frameworks for understanding ideas of shit as taboo, Mary Douglas’s (1966) definition of dirt as “matter out of place” and her conceptualisation of pollution and taboo as means by which different cultures create and police social and environmental boundaries are especially valuable. Douglas’s identification of cultural differences in “natural” and “unnatural” behaviour also enhances understandings of spatial and temporal variations in cultural attitudes towards excrement.

Building upon Douglas’s research, a range of fascinating studies have examined how dirt, contamination and disgust are conceptualized (and find expression) within different geographical contexts (Campkin and Cox, 2007a; Cresswell, 1996, 1997; Miller, 1997; Sibley, 1995). Cox, (2007: 153), for example, emphasizes how “the traditions of writing on urban sanitation, squalor and decay have no counterpart in rural studies” which gives rise to intriguing tensions between imaginations of rural spaces as clean, pure and healthy and the actual importance of dirt, sweat and manure in traditional rural livelihoods (Holloway et al, 2007). In the country, dirt (and shit more specifically) is not “matter out of place” but “an integral part of how the countryside is constructed, in the imaginations of both rural communities and urban dwellers” (154).

In the colonial imagination, binaries separating clean and sanitary Europeans from their disgusting colonial Others, created “geographies of contamination” linked to dirty, undrained and malodorous spaces (McFarlane, 2008b; 2008c). Likewise, American disgust at indigenous defecation practices in the Philippines was linked to “excremental colonialism” (Anderson, 1995) as modernising strategies were employed to enforce and disinfect social and racial boundaries. Reformers frequently faced local resistance to modernist norms about the use of public and private spaces. McFarlane (2008b), for example, cites Leith’s complaint that despite signs threatening penalties for urinating or defecating in particular places, “nuisances of the most odious kind are daily or nightly committed under them” (Leith, 1864: 16). Similar conflicts over the use of public space are common today as parks are used by India’s middle classes for recreational purposes and by its urban poor as places for open defecation (McFarlane, 2008b). Addressing such convergent uses can be very difficult, as individual (private) acts of defecation soon become a significant public problem that is difficult to police: a situation that reflects wider tensions between the private production and public management of faeces (Poovey, 1996; Laporte, 2000; Hawkins, 2006).⁷ Gay Hawkins elaborates on this theme, arguing that waste “that is most threatening to the self has to be rendered out of sight as quickly as possible” (46) and highlighting the effectiveness of sewers in transforming “shit to effluent, from private waste to public problem” (67).

Although taboos surrounding human excreta are extremely widespread (Douglas, 1966), there are significant spatial and temporal variations in their nature. Very generally speaking, some (faecophilic) cultures tolerate the handling of shit, whereas other (faecophobic) cultures find it abhorrent or ritually polluting and even the words that describe it are deeply offensive to them (Esrey et al, 1998; van der Geest, 1998). In urban China, for example, night soil workers wheeling wooden “honey carts” remain common in unsewered residential areas and in northern Vietnam there is a long tradition of using fresh human faeces to fertilize rice fields (Hart-Davis, 1997; Esrey et al, 1998).

In India, by contrast, the handling of human waste is taboo for many Hindus and has been traditionally designated as a job for so-called “Untouchable” or “sweeper” communities that have responsibility, under India’s caste system, for disposing of human excreta

(Ramaswamy, 2005). Close to 800,000 such people make a living from collecting and disposing of human faeces – often working with their bare hands – and the persistence of cultural norms relating to notions of pollution and purity reinforces such practices. Although most Indian states have made “manual scavenging” illegal, the removal of human waste, often by headloading, is still widespread in rural areas and from dry latrines in urban areas (Ramaswamy, 2005). And while such work is loathed by the communities responsible for it, wider social prejudice against them makes it difficult to obtain alternative employment (ibid; Jewitt and Baker, 2006; Baker and Jewitt, 2007).

A rare anthropological investigation into cultural attitudes towards shit in Ghana (van der Geest (1998) reveals that faeces are similarly taboo amongst the Akan community where jobs involving the emptying of toilet buckets and the cleaning of public lavatories are carried out by “krufoo” (people of the night) who traditionally originate from Sierra Leone and Liberia. According to van der Geest, nobody from the Akan community “would ever think of performing this kind of dirty and poorly paid work. Neither would they be willing to do this work if it were well paid” as krufoo “are the personification of the Akan horror of shit and have to make themselves and their work invisible” (ibid 10). Yet defecation in Ghana is associated with many contradictions. A desire to rid the body of dirt is hugely important to Akan culture and manifests itself in the Twi language where expressions of beauty are almost synonymous with those of cleanliness. But despite their obsession with avoiding dirt, Akan people have extremely inefficient systems of dealing with faeces. These range from the use of filthy, crowded and often overflowing public latrines to defecating in plastic bags which are later thrown either in the bush or out with the household garbage. This paradox is described by van der Geest as “the hygienic puzzle” which he attributes to the fact that the faecophobic Akan are so afraid of shit that they simply refuse to think about it and the fact that they “have to pass through dirty places and faeces” is a consequence that they are able to put out of their minds (1998: 12).

Similar observations are made by Mukhopadhyay (2006: 226) who notes how in Kolkata, public indifference to dirt and filth contrasts strikingly with the scrupulous attention paid to private cleanliness and bodily “purity” as “once waste is pushed out of the physical boundary of the house, it then belongs to the ‘public’ ... domain ... and therefore, everybody is entitled to dump rubbish or even defecate in it”. Likewise, Srinivas (2002: 382) argues that Indians have “a paradoxical relationship with excrement” and notes how they are “particular about its removal from the private sphere, [but] no infrastructure is designed to remove it from the public sphere”. As a result, attempts to privatize faeces in by encouraging people to defecate in individually owned toilets rather than on public land have often met with resistance in urban areas. In rural India, meanwhile, tensions often exist between the ritually polluting nature of excrement and its potential value as agricultural manure.

Yet cultural attitudes towards shit are by no means static over time and space. Douglas (1966) and Cohen (1995) recognized ambiguity in human perceptions of dirt/shit and Laporte (2000: 32) shows how “that which occupies the site of disgust at one moment in history is not necessarily disgusting at the preceding moment or the subsequent one”.⁸ A good example is changing attitudes towards the use of human waste as an agricultural fertilizer (Bacon, 1956; Laporte, 2000; Duncker et al, 1997; Rockefeller, 1998; Esrey et al, 1998; Jewitt, 2010).⁹ In nineteenth century France, Pierre Leroux (1840; 1853) sought to refute Malthus by developing his “circulus” theory which linked excrement to the abolition of poverty through improved cycles of nutrition and secretion (Laporte, 2000).¹⁰ Likewise, Goddard (1996) describes the use of town waste as a fertilizer in Britain during the first half of the nineteenth century as growing towns created a sewage disposal problem that rural areas helped to alleviate. Echoing Leroux, there was enthusiasm that by “practically transforming

filth into food” a “peaceful, moral and social revolution would be effected” (F.C. Krepp 1876, cited in Goddard, 1996: 277).¹¹

At around the same time, Henry Moule advocated recycling the contents of earth closets for use as a garden fertilizer and wrote widely about the relative disadvantages of water-borne sanitation (Hart Davis, 1997).¹² For many years, water and earth closets were in competition, but miasmatic theories of disease favoured water closets for their ability to remove foul odours (Esrey, 2001). Another advantage was their efficiency in removing shit from the private to the public sphere where it became the state’s problem (Hawkins, 2006).

III Contemporary sanitation geographies

The main methods of dealing with human waste today consist of either “flush and discharge” systems or “drop and store” approaches that do not require piped water and sewers (Esrey et al, 1998). Over the past 150 years, flush and discharge technology has become dominant in municipal areas with many developing world cities seeking, often with the help of international funding, to adopt such systems.

Unfortunately, flush and discharge systems are unlikely to be affordable or environmentally sustainable for many parts of the global South. According to Esrey et al (1998), annual investments in such systems amount to around \$30 billion excluding maintenance costs while shortages of fresh water are a serious constraint in many areas.¹³ To complicate matters, around 4 billion people – mostly poor people from the developing world – will live in countries with high water stress by 2025 unless drastic developments are made in terms of pollution control and water use efficiency (Cosgrove and Rijsberman, 2000). Yet each person using a flush and discharge toilet typically flushes 5 litres of faeces, 4-500 litres of urine and 15,000 litres of pure water per year. To this, a further 15-50000 litres per person of “grey water” (from bath, kitchen and laundry water) is added, so a very small amount of excrement is allowed to contaminate a huge amount of pure and “grey” water (Esrey et al, 1998).

The lack of wastewater treatment in many parts of the global South results in the majority of such water being allowed to discharge, untreated, into rivers, lakes or the sea, leading to a “loss of fresh water, food insecurity, destruction of soils, and loss of biodiversity on land as well as in marine environments, global warming and depletion of ozone” (Esrey, 2001: 4). As less than a fifth of wastewater is treated in Brazil and Mexico and around 13.5% in India (Black and Fawcett, 2008), there is growing recognition that inadequate sanitation improvements can be worse than no improvements at all. According to the UNDP (2008), “Conventional sewage systems, based on flush-toilets, have failed to solve the sanitation needs for developing countries”. Esrey et al (2001) criticize such systems for being based on nineteenth century assumptions that “human excreta are a waste suitable only for disposal, and that the natural environment is capable of assimilating this waste”. Esrey (2001) argues that such systems are incompatible with sustainable development as they destroy pathogens only when combined with effective sewage treatment facilities; which are largely absent in developing world countries. As a result, the pollution/infection problem is simply shifted downstream, “to those who are poorer who won’t complain” (Esrey, 2001: 4-5).

In order to meet the sanitation MDG target, therefore, there is a need for governments in the global South to consider expanding sanitation options to a range of cheaper and more sustainable alternatives to flush and discharge systems (Esrey et al, 1998; Satterthwaite, 2003; Arby, 2008b). This will require policy-makers and development practitioners to develop better understandings of diverse spatial, socio-economic and cultural variations in existing sanitation practices and translate these into “improved” (and locally acceptable) sanitation systems and behaviour (Black and Fawcett, 2008). According to Satterthwaite, the

challenge is as much to do with “developing ways to support bottom-up processes accountable to low-income groups (and often initiated and managed by low-income groups), as it is to do with total financial flows” (Satterthwaite, 2003: 190).

1 Ecological sanitation

Given its strong links to historical associations between shit and wealth, one of the most interesting low cost, community-based alternatives currently being emphasized is the use of human waste to address soil fertility decline and reduce poverty. The UNDP (2008) states that for “food security and agricultural purposes there is a need to utilize the valuable nutrients in human excreta”. Its favoured method for achieving this is through the use of “ecological sanitation systems” (ecosan) based on the use of either composting or dehydrating toilets. Resonating with Leroux’s (1853) *circulus* theory, Esrey (2001: 2) describes ecosan as a “closed-loop ecosystem approach to the management of human excreta” whereby waste is returned to the land to help produce food, plants, trees etc., which are then returned to humans. Additional advantages of ecosan include the fact that it does not require water for flushing and not only is “water preserved for drinking, rather than flushing, receiving bodies of water are protected from nutrients and organic matter. The environmental and human health risks are minimized and eliminated” (Hannon and Andersson, 2001a: 1). Nor do ecosan systems need to be connected to conventional sewers as they render faeces pathogen free, in situ and without causing pollution downstream.¹⁴

Ecosan systems also reduce the need for chemical fertilizers that deplete fossil fuel resources and leach into ground and surface water sources (Esrey, 2001; Hannon and Andersson, 2001a; Jewitt, 2010). Dehydrating ecosan systems usually contain “urine diversion” (UD) arrangements that take advantage of the fact that the 4-500 litres/year of urine produced by an average adult contain “enough plant nutrients to grow 250 kg of grain, enough to feed one person for one year” (Esrey et al, 1998: 75). Ecosan has been introduced in many parts of China, southern India, South Africa and Central America and has been effective in generating incomes for local communities through the sale of compost and from higher crop yields resulting from increased soil fertility (Wherever The Need, 2008; Esrey et al, 1998; Hannon and Andersson, 2001a). Echoing nineteenth century claims (Bertherand, 1858; Leroux, 1840; 1853) that shit can help to abolish poverty, Hannon and Andersson (2001b) – whose views are endorsed by the UNDP – argue that:

“ecological sanitation systems can make an invaluable contribution to sustainable livelihoods and poverty reduction ...by increasing food security through the return of nutrients from excreta to the soil to increase soil fertility and by reducing pollution and health risks ... Ecological sanitation approaches are far more feasible than conventional sanitation systems both financially and environmentally ... and thus offer more from a sustainable livelihood and poverty reduction perspective” (4).

But despite their obvious advantages, ecosan systems, like dry conservancy methods before them, are unlikely to threaten the dominance of flush and discharge systems. To understand why this is the case, it is necessary to delve into the spaces where powerful emotions and taboos associated with human waste interconnect with a similarly powerful desire, by many (but not all), for the improvements to environmental health, convenience, cleanliness and social status that water-borne sanitation can provide. Geographical insights are particularly important in this regard as they are sensitive to variations in socio-economic, cultural and environmental conditions and emphasize the need for locally appropriate initiatives.

IV Understanding local priorities: the need for sanitation “software”

According to Chapman (1999), the global popularity of flush and discharge systems can be attributed in part to a longstanding “obsession” with water borne sanitation by civil engineers

which has in turn resulted in a lack of attention to alternative systems. Black and Fawcett (2008), meanwhile, highlight the convenience, congeniality and cultural acceptability of flush and discharge systems to the user as a major factor in their worldwide popularity. Water also has added advantages in terms of its ability to clean, scour and expunge smells from the sanitation systems that it works within. As a result, water closets “are the toilet of choice throughout the world, and no-one who is anyone wants to endure the humility of inferior domestic arrangements” (ibid 9). And because of such aspirations, development NGOs and investors often create new environmental and health problems when they “pay for conventional water closets without considering sewage disposal” (Arby, 2008b: 1).

Although ecosan offers more promising solutions than traditional “dry conservancy” methods, it faces significant cultural barriers to adoption. Systems with urine diversion present particular difficulties for people unused to directing urine and faeces to different areas of the toilet. Unlike sewerled flush and discharge systems, users also have to handle the end products, albeit in a much less offensive form: a situation that has greater acceptability in faecophilic societies than faecophobic ones.

So although hundreds of thousands of composting and dehydrating toilets are currently in use around the world, people who already use or aspire to use flush toilets often regard ecosan with suspicion. Speaking of Uganda, Jemsby notes that “people dream of toilets that flush. To own one means you’re successful” (Jemsby, 2008: 6). Elaborating on this issue, Black and Fawcett (2008: 132) argue that:

Most people used to a water-seal porcelain toilet which accepts both forms of waste plus cleaning materials and disposes of them with infinite ease will be difficult to persuade that UD and dry systems are superior, whatever their ecological merits...and... given a choice between ‘wet’ and ‘dry’, people new to sanitary ware, especially in faecophobic societies, tend to prefer ‘wet’.

Such preferences illustrate the importance of considering locally-specific sanitation “software” and the dangers of attempting to impose hardware solutions that are inappropriate to individual socio-cultural settings.

1. Geographies of resistance to sanitation

One “software” factor that has received increasing recognition is the fact that education and knowledge about excrement-related health risks are rarely sufficient to create demand for improved sanitation. Initial attempts to improve sanitation access focused on educating potential users about “faecal perils” and how to reduce faecal to oral pathogen transmission (Black and Fawcett, 2008). But because local defecation practices are often influenced by deeply entrenched cultural norms and taboos, health education often changed sanitation practices little beyond encouraging better hand washing. Approaches emphasising personal cleanliness have often been more effective than health messages alone. A highly effective initiative in Indonesia, for example, linked sanitation to purity and environmental cleanliness: messages reinforced by local imams who prevented people without pit toilets from marrying or participating in the Haj (ibid; Mathur, 1998).

Many less successful initiatives have demonstrated that people are often reluctant to adopt sanitation; sometimes because of locally specific cultural taboos, but often because open defecation is actively preferred. Although research on why people shun modern sanitation is scarce, a few studies have highlighted some fascinating reasons behind socio-cultural resistance to toilet use. In parts of Madagascar, there are strong taboos against storing sewage underground (where it would contaminate the dead) and putting one person’s faeces on top of another’s; both of which exclude the use of drop and store systems (Black and Fawcett; 2008; Ramanantsoa, 2004). Colonial reports in Uganda, meanwhile, indicated

resistance to the use of cess pits as they might allow excreta to be used by sorcerers to cause harm (Gillanders, 1940).

A more widespread reason for resistance to sanitation is that in rural areas where there is plenty of space and privacy is not hard to achieve, people often choose open defecation in preference to using a smelly, mosquito-infested toilet that other users have not bothered to clean properly. We only have to think about our own distaste for using poorly maintained public toilets to empathize with such choices. In hot countries where plenty of space is available, open defecation makes sense. Chickens dogs and pigs are effective “faecal vacuum cleaners”¹⁵ and what they leave behind is quickly sanitized by the sun (Hall and Adams, 1991; Esrey et al, 1998). During my own fieldwork in rural India, early morning walks to a nearby field necessitated the collection of sufficient ammunition (stones, sticks, clods of earth) to ensure that hovering pigs and dogs waited until my daily visit was completed before moving in.

2. The dangers of open defecation

Although such arrangements are commonplace in the global South, it is important not to romanticize open defecation. While it may be appropriate, in combination with wider hygiene messages, in rural areas where there is strong resistance to toilet use, open defecation is highly problematic in more densely populated settlements. Many of the 2.6 billion people that currently practice open defecation do not do so by choice. In urban areas, people are forced, by a lack of working public facilities, to defecate in ditches, buckets, plastic bags and by lakes, rivers and railway tracks: arrangements that encouraged Paul Theroux to coin the phrase “the turd world” (WaterAid, 2009b). In India, wider cultural taboos surrounding human waste tend to reinforce open defecation because manual scavengers continue to have responsibility for cleaning up the mess (Ramaswamy, 2005).

Where water is used to dispose of faeces, health problems are particularly widespread as the same water is often used for drinking and washing purposes due either to a lack of knowledge about the diseases spread by human waste or a shortage of alternative water. On land, human faeces facilitate the breeding of parasites and flies, which act as important disease transmission vectors when they settle on food and human bodies (Wherever The Need, 2008).

For women in many parts of the global South, the problems are even more pronounced as cultural norms coupled with a desire to maintain some privacy dictate that they must relieve themselves under cover of darkness (Hannon and Andersson, 2001a). Unfortunately these are times when the risk of scorpion or snake bites are highest and the predictability of women’s movements also puts them at risk of being attacked or raped (Wherever the Need, 2008; Hannon and Andersson, 2001a). During interviews with slum dwellers in Mumbai and Pune, one woman told Bapat and Agarwal (2003: 74) that “A few of us generally go together for the toilet. Men hide behind the bushes and watch women when they are squatting. If they see a woman alone, they creep in and molest her”. In addition, the discomfort caused by restricted defecation times (which increase the risk of urinary, gastric and other infections) and a lack of privacy should not be underestimated (UN, 2008e).¹⁶

3. Promoting appropriate sanitation that meets local demand

In order to increase the number of people benefitting from improved sanitation, there is an urgent need to understand which systems are appropriate in different socio-economic and cultural settings. As most of the 2.6 billion lacking access to improved sanitation are the same 2.6 billion that live on under \$2 per day, economic constraints are a clear limitation. But as the rapid uptake of mobile phones in the global South has illustrated, many impoverished

communities have important sources of latent wealth and “resource mobilisation potential” (Parikh and McRobie, 2009) that can be tapped if there is sufficient demand. Initiatives in India by the Ahmedabad Slum Networking Project to provide water infrastructure and individually-owned flush toilets had few difficulties in attracting investments of Rs. 13880/family, of which the government provided Rs. 5940 (Parikh, 2010). According to Parikh and McRobie (2009) most participants in Sanjaynagar were happy with their return on investment in terms of the increased value of their housing stock (to which the government had given them secure tenure), reduced infant mortality rates (by a third), lower medical expenses (Rs. 1069 to 350/month) and fewer working days lost (from 64 to 9/month).

In more densely populated slums where there is no scope for individual latrines, local communities are sometimes happy to pay a small daily charge to use a clean, well-maintained block of public toilets (Burra et al, 2003; Hanchett et al, 2003; McFarlane, 2008a). Such blocks have also been shown to be socio-economically appropriate and environmentally sustainable where local communities play a major role in their construction and management (Hasan, 2002; Burra et al, 2003). Conversely, many “top down” donor- or government-funded sanitation projects have failed because they discovered that demand for community toilets or funds for their upkeep were insufficient for users to commit to the time and expense of maintaining them (Satterthwaite, 2003; Burra et al, 2003; Davis, 2006; Black and Fawcett, 2008; McFarlane, 2008a). A major stumbling block is that open defecation is free of (financial) cost and if improved sanitation turns out to be an unpleasant experience, many will soon stop paying to use/maintain it and will revert to open defecation or “wrap and throw” where open spaces are hard to come by.

A key “software” factor in the success of improved sanitation, then, is the existence of a strong demand for some form of toilet. And where this is lacking, it is important to know how it can be created and, more importantly, maintained, if progress towards the sanitation MDG target is to be achieved. Convenience is a clearly an important factor influencing demand for a toilet. This is especially true in urban areas where privacy and open spaces are in short supply (Jenkins, 2004) and for women given the health and safety risks they face during open defecation (Bapat and Agarwal, 2003). In an interesting development linked to increasingly masculine sex ratios in northwestern India, women have gained greater bargaining power when seeking a marriage partner and are placing toilets high on their list of priorities. The Indian press has publicized their demand for the convenience and privacy of a toilet with the slogan: “No Loo? No ‘I Do’!” (Wax, 2009).

This is not a recent trend however. Historical experience in urban Britain indicates that an increased desire for privacy and personal cleanliness was far more important in creating demand for improved sanitation than health concerns.¹⁷ Strong historical parallels also exist in terms of the social status associated with a WC (Laporte, 2000; Campkin and Cox, 2007b). The first flushing toilets in Britain and France were owned by the aristocracy who introduced the desirability of defecating in private and in comfort to the rest of the population. Srinivas (2002: 303) describes a similar process in his analysis of changes to “traditional concepts of purity and the more modern notions of cleanliness” in Bangalore, India. In particular, he shows how the traditional separation of polluting (toilet) areas and the pure spaces of home has been gradually eroded with the shift to large, modern “attached bathrooms”.

Even amongst less wealthy urban households, there is a high degree of social status associated with having a toilet as “No-one who aspires to be anyone in town chooses to live without a proper place to shit if they can afford one” (Black and Fawcett, 2008: 51). A study by Jenkins (2004) in Benin revealed that prestige and the desire to demonstrate “modern behaviour” were key factors behind toilet construction in areas within 3 km of urban centres.

In a similar way, experience of urban living can be important in bringing sanitation to rural areas. During my own village-based fieldwork in Jharkhand (India), I came across only two households that had pour flush latrines. These belonged to villagers who worked in government service and lived in urban areas during the week. They installed toilets primarily for the convenience of their family members but also to ensure that urban visitors would have a decent place to “go”.

But a toilet must also be pleasant to use if it is to encourage people to part with their hard earned cash when they could “wrap and throw” for free. In a study conducted by Jenkins and Scott (2007) in Ghana, disgust with existing public facilities was a major factor encouraging households to consider building private toilets. Elsewhere, a wider desire for cleanliness (environmental and personal) has been important in creating demand for improved sanitation. In Bangladesh, the “shame approach” was effective in shocking villagers into making linkages between dirtiness and open defecation (Arby, 2008b).¹⁸

But even when demand for improved sanitation is in place, excrement can still create serious health hazards if not properly contained or disposed of safely. In India, it is common for toilets to discharge directly from middle class households into open ditches where children play. The problem here seems to reflect wider private/public divides between the production and management of human waste (Hawkins, 2006) as well as a degree of ignorance about “faecal perils”. Another difficulty is that the creation and maintenance of effective on-site sanitation and sewerage has been severely neglected in the developing world, despite a long tradition of public-funded sewers in the global North.¹⁹ Consequently, unsewered flush systems provide limited health benefits for local communities and on-site systems that lack adequate arrangements for cess pit emptying create serious environmental and health problems (and reversion by previous users to open defecation) when they overflow (Black and Fawcett, 2008).

So in the absence of widespread demand for ecosan-type systems that render human waste harmless, innovative solutions are urgently needed for the management of human waste discharged from conventional water flush systems. One of the most successful low cost sanitation initiatives, the Orangi Pilot Project (OPP) in Karachi, Pakistan, used a combination of participatory techniques and technical assistance to mobilize the residents of Karachi’s informal settlements into digging, laying and maintaining their own sewers. The scheme was financed largely by the local community and since its inception, over 96,000 households have installed sewerage toilets and have invested over US \$1.5 million of their own money in these systems, achieving sanitation at a sixth of the cost that the Karachi Municipal Corporation would have charged (Hasan, 2002; Alimuddin et al, 2004). In a similar community-based initiative, the Ahmedabad Slum Networking Project has used the natural topography of their sites to drain sewage out of the slums and towards the city’s trunk sewers which connect in turn, to a local treatment plant (Parikh and McRobie, 2009; Parikh, 2010).

With on-site initiatives, there is potential to use the waste to provide “humanure” and/or biogas where cultural taboos and health concerns permit this (Duncker et al, 2007; Li and Mae-Wan, 2008; Mae-Wan, 2008; Jewitt, 2010). The use of human waste to produce biogas is widespread in China where long detention times in settling chambers reduce the risk of spreading pathogens and internal parasites. (Reddy et al, 1995).²⁰ Also there is little socio-cultural resistance to biogas sludge containing human waste because of China’s long tradition of using human excrement directly on agricultural fields. Although it is widely assumed that such systems would be culturally unacceptable in India’s faecophobic culture, a recent pilot study that I initiated in rural Madhya Pradesh indicated that cultural resistance may not be as great as expected. Discussions with fifty households regarding the acceptability of human waste as a source of biogas and agricultural fertilizer (derived from the biogas slurry) indicated that 46% thought that this was a good idea and 48% indicated a willingness to

install such systems if the cost was acceptable (Jewitt and Labhsetwar, 2009). The remaining 52% were mainly concerned that food cooked with excrement-derived biogas would not taste good. When asked about the use of slurry derived from such biogas as agricultural manure, half were in favour and 52% said that they would be willing to use it on their own fields or homestead gardens. Although these data reflect what villagers *said* they would do, rather than what they would actually do in practice, they indicate scope for investigating the acceptability of linking latrines to biogas digesters within different areas of India and elsewhere.

Other important ways of tackling on-site sanitation involve raising the status of people that deal with shit. After all, people that deal with human waste in the global North can often command good wages *because* of their willingness to undertake tasks that repulse others. Black and Fawcett advocate the encouragement of small-scale sanitation businesses that offer affordable cess pit emptying services that can operate even in settlements with poor accessibility. For such systems to succeed in the Indian context, however, there is an urgent need to address the invisibility and social ostracism suffered by “untouchable” sweepers (Ramaswamy, 2005). In the meantime, there are sound arguments for providing subsidies for sewerage and the emptying of on-site systems on the grounds of the wider (public) waste disposal function that they have in addition to their provision of private sanitation (Black and Fawcett, 2008).

V Conclusion

In spite of efforts during the 2008 International Year of Sanitation to tackle the “great distaste” and raise awareness of the problems associated with inadequate sanitation, major strides need to be taken if there is to be any hope of meeting the sanitation MDG target by 2015. Sanitation continues to be largely neglected in many developing countries’ poverty reduction strategy papers and government-backed sanitation initiatives, where they exist, often prioritize flush and discharge systems over low cost or community-based alternatives; regardless of demand for them by potential users or their appropriateness within local socio-economic, political, cultural and geographical contexts (Burra et al, 2003; Hanchett et al, 2003; Satterthwaite, 2003; Black and Fawcett, 2008; McFarlane, 2008a).

Experience in Europe and the global South has demonstrated time and again that imposed sanitation will not work (World Bank, 2003). There has to be strong demand for it and the systems on offer have to address the priorities of potential consumers if they are to consider investing their limited savings in them. At the same time, policy-makers, development planners and sanitation engineers need to be flexible enough to work around local environmental conditions and the needs, aspirations and taboos of local communities (McFarlane, 2008a).

As Satterthwaite (2003) argues, it is possible to achieve a great deal on a limited budget if adequate and locally sensitive support is given to enable different communities to address their sanitation priorities. The Orangi Pilot Project and similar community-led sanitation schemes have demonstrated this very well, with a key element of their success lying in their sensitivity to local geographical contexts and emphasis on local participation and skill development. The OPP, for example, ignored official recommendations on drain construction (which had been transplanted from Britain and were designed to withstand frost heave) and designed locally appropriate alternatives that could be maintained by participating households. The NGO also demanded that over 90% of households in each lane had to commit labour for improved sanitation before they would offer technical assistance and training: a situation that generated intra-community pressure to participate (Hasan, 2002).

Although the OPP approach has been quite successful elsewhere (Alimuddin et al, 2004), the culturally-sensitive nature of attitudes towards shit and sanitation often means that attempts to “scale up” community-based initiatives fail because they are uprooted from the

social and political geographies that enabled the original projects to function (McFarlane, 2008a; Gandy, 2008). Although international donors increasingly recommend engagement with local communities during the planning of watsan initiatives (World Bank 2003), participatory interventions by NGOs are no guarantee of success. More importantly, these organisations are “themselves embedded in social power structures and cannot be removed by electoral means if they fail to fulfil grassroots expectations.” (Gandy, 2008: 120). Black and Fawcett therefore argue that detailed information needs to be “gathered in many settings before not only the ‘why’ of sanitation spread, but also the ‘how to do it here’ can be laid with conviction before policymakers, programmers and consumers” (207).

Even then, human geography will remain crucial in determining the success and sustainability of sanitation initiatives. Research in Mumbai by Gandy (2008) and McFarlane (2008a; 2008c) draws attention to the city’s “hydrological dystopias” and how its physical, political and economic landscapes display acute inequalities in access to water and sanitation. They draw particular attention to the geography of water and sanitation politics in the city, showing how access to water and the location of public toilet blocks are frequently linked to political patronage in slums; especially where “payment for use” arrangements generate large sums of cash for the politicians that control them (Davis, 2006). The political ecology of how state interventions combine with an expanding “shadow state” (Harriss-White, 2003) is also relevant to geographies of sanitation as new forms of political activism have arisen to address the “material realities of social injustice experienced by the urban poor” (Gandy; 2008: 120). Physical geography also plays an important role in the sustainability of sanitation and sewerage systems. Black and Fawcett (2008) argue that in remote rural areas where the sun acts as an effective sanitizing agent, better health and hygiene education emphasising the careful disposal of faeces and hand washing after defecation may be as much as can realistically be achieved if demand for improved sanitation is low. Consequently, efforts to meet the MDG target by aiming improved sanitation predominantly at rural people (around 2 billion of whom currently lack it) could be an inappropriate use of resources in areas where open defecation is associated with low levels of disgust, inconvenience and risk of attack from animals or other humans. Mukhopadhyay (2006) also highlights the need for a shift in mindset with regard to sanitation norms. In particular, he notes how defecation practices other than those used in the industrialized north tend to be regarded as unacceptable and humiliating: a situation that often forecloses other options.²¹

What is appropriate and sustainable in rural areas, of course, is likely to have limited applicability in densely populated urban contexts. For the (officially recognized) 600 million urban dwellers that currently lack improved sanitation, the demand and need for toilets is often much greater (Satterthwaite, 2003). Yet municipal authorities frequently ignore the sanitation requirements of the poorest urban populations because they live in illegal or officially unrecognized slums and present a limited “threat from below” (Chapman, 1999). In terms of achieving the sanitation MDG target, urban-based initiatives have many advantages associated with high levels of demand, existing infrastructure, economies of scale and potential for community action (Satterthwaite, 2003: 189). Where access to water or sewage disposal are significant constraints, it may be advisable to explore whether low-tech alternatives to conventional flush and discharge systems are acceptable within local socio-economic, cultural and environmental contexts. McFarlane (2008a) argues for more flexible approaches to sanitation initiatives in slums and informal settlements that can take account of their “diverse social geographies” (89) and allow proper engagement with potential users.

In conclusion then, it is argued that “hardware” approaches by themselves are unlikely to meet the sanitation MDG target and certainly not by 2015. Instead, greater emphasis on sanitation “software” in different geographical contexts is urgently needed if local human waste management preferences are to be understood and appropriate solutions

are to be found to today's sanitary crisis. At the same time, there is a need for sensitivity to the wider political ecologies of sanitation provision in specific local contexts as well as the environmental, socio-economic and cultural appropriateness of different sanitation options. The number of geographers involved in such work remains small, but as Colin McFarlane and Matthew Gandy have demonstrated, geographical insights obtained from spatially situated empirical research are central in promoting better theoretical and applied understandings of this rather unsavoury topic. According to Odumosu (2010), one of the most important research challenges that UNICEF has identified in the watsan sector is to establish under what circumstances people in different geographical areas and cultural contexts become willing and able to change their sanitation behaviour and practices. Perhaps if more geographers were willing to confront the "great distaste" surrounding human excrement, they would open up new and exciting lines of enquiry on this topic. At the same time, the theoretical and policy-relevant contributions that such work could make would help to satisfy recent demands for greater "impact" in academic research and "engagement beyond the academy" (Pain, 2004: 652).

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¹ In an excellent book that discusses a wide range of sanitation-related issues in the global South, Black and Fawcett (2008) argue that the "great distaste" surrounding sanitation is responsible for the scarcity of academic research and literature on the "software" issues surrounding sanitation practices. To illustrate the nature of this research gap and highlight how socio-cultural attitudes towards human shit vary over space and time in ways that are particularly interesting to geographers, a range of examples is drawn from this book.

² According to Black and Fawcett (2008) improved sanitation reduces diarrhoeal infections by 32% on average while improved water supplies reduce infections by 6%. This is because human faeces contain pathogens, parasites and their eggs which quickly contaminate water used for drinking, cooking and washing when they come into contact with it (Esrey et al, 1998)

³ In an attempt to encourage world leaders to maintain their commitment to the MDG sanitation target, WaterAid has attracted much recent attention with its “dig toilets not graves” campaign (<http://www.digtoilets.org/>).

⁴ As Gandy (2008: 126) points out, “the Western model of the ‘bacteriological city’, with its universal water and sewerage systems, rests on the assumption that urban space is both relatively homogeneous and spatially coherent, which is at odds with the extreme forms of social polarization and spatial fragmentation experienced in the cities of the Global South”.

⁵ Cattle are widely venerated in India and their dung is regularly used for ritual purification

⁶ Particular focus is placed on India given that most of my own field research has been carried out there.

⁷ According to Hawkins (2006: 52), Laporte views King Francois I’s sanitation edict of 1539 as the start of an important political process whereby “shit became a political object through the process of making it an individual or private responsibility, making its producers legal proprietors”. This edict enjoined the citizens of Paris to refrain from emptying chamber pots, animal manure “or any other kind of unspeakable wastes on the streets” and ordered them to build private latrines (privés) in their homes which discharged into cesspools (Laporte, 2000: 5).

⁸ Laporte discusses how urine was commonly used in fifteenth century France to clean clothes until Parisian haberdashers appealed to the King in 1493 on the grounds that “bonnets and other effects cleansed by means of piss are neither proper nor appropriate nor healthful to place on one’s head; there lurks infection in these methods” (32). But the practice was again in use by around 1550. Uric acid was also considered valuable for use in the leather tanning industry and in Roman times, containers were placed in wool and leather workshops for men to urinate into as the urine was used to clean wool and animal skins (Ecosan, 2008).

⁹ The use of human shit as a crop fertilizer has a long history in China and the Japanese implemented a system of recycling human and animal faeces for agriculture in the twelfth century. In China, traditional squatting slabs were often designed to divert urine so that it could be collected for use as a fertilizer (Esrey et al, 1998). As recently as the 1950s, around 90% of China’s human waste was put on agricultural fields, making up a third of the total fertilizer used (Hart-Davis, 1997).

¹⁰ In his Letters to the States of Jersey, Leroux (1853) developed his “circulus” theory, which postulated that “nature has established a circle that is half production and half consumption; neither of these halves could exist without the other, and each is equal to the other; The circle constitutes the physiological existence of each being, and even of each organ inside each being: Nutrition and Secretion” (Leroux, 1853, cited in Laporte, 2000: 130).

¹¹ With regard to the beneficial qualities of urban sewage as an agricultural fertiliser, enthusiasm gradually waned, as sewage irrigation proved less economically viable in Britain’s wet climate than in Mediterranean countries. Problems of where and how to store the sewage until it could be carted away and the costs of transport to rural areas made it difficult to compete with other sources of manure. Cultural and health factors also became important in the 1870s when the threat of sewage to human health started to be prioritized over its potential value as manure (Goddard 1996).

¹² Henry Moule argued that: “Water is only a vehicle for removing [excrement] out of site and off the premises. It neither absorbs nor effectively deodorizes ... The great ... agent ... is dried earth, both for absorption and for deodorizing offensive matters,” (quoted in Hart-Davis, 1997: 100).

¹³ Already, 40% of the world’s population inhabiting 80 different countries are suffering from seasonal water shortages while much of Africa, the Middle East, northern China, parts of India, Brazil, central Asia and Mexico suffer from chronic fresh water shortages (Esrey et al, 1998).

¹⁴ According to Esrey et al (1998) the most quick and effective way of killing of pathogens in human excreta is to expose them to low moisture levels and high temperatures. Around 99% of faecal coliforms in soil die within two weeks during the summer and three weeks in winter although temperatures of above 60 degrees C will kill most faecal pathogens within minutes. Resistant parasites such as *Ascaris lumbricoides* and *Cryptosporidium parvum* are destroyed far more effectively by heat and dehydration than conventional sludge stabilization treatment (anaerobic digestion at 20-25 degrees C) which releases surviving pathogens into the environment.

¹⁵ Black and Fawcett comment that the “rules about what meat is allowed to be eaten in certain religious codes are directly connected to the eating habits of certain small livestock, whose presence in the community is nothing to do with food-raising or food-hunting, let alone enjoyment as household pets, but is deliberately tolerated for a certain unsavoury purpose”(84).

¹⁶ According to the UN (2008e) “Sanitation enhances dignity, privacy and safety, especially for women and girls. It improves convenience and social status. Sanitation in schools enables children, especially girls reaching puberty, to remain in the educational system. Restricted toilet opportunities increase the chance of chronic constipation and make women vulnerable to violence if they are forced to defecate during nightfall and in secluded areas. Providing improved sanitation facilities is a liberating development for women and girls and is providing substantial benefits for the whole community”. The implications of poor sanitation for girls’ education can also be serious and research in Tanzania during the 1980s showed how girls missed school during

menstruation due to a lack of adequate toilets (Hannon and Andersson, 2001b). According to Burrows et al (2009), this has significant socio-economic costs as “for every 10% increase in female literacy you can expect a 10% increase in life expectancy at birth. You can also expect the country’s economy to grow by 0.3%”.

¹⁷ Black and Fawcett (2008: 160-1) argue that “in the 19th century, the spread of the flush WC was initially a response to consumer demand. Its success as a consumer item helped to precipitate the sanitary crisis in rapidly urbanizing Britain; it was part of the problem, not the response”.

¹⁸ Arby describes how “when people comprehend that flies, dogs and lack of hygiene transfer excreta to hands, food and water, they realize they are literally eating each other’s shit! Shame and disgust well up. Reactions are fierce. And immediate action is requested” (Arby, 2008b: 3).

¹⁹ Black and Fawcett ask that “if the whole of the sewered and industrialized world has had their excreta removal system – not their toilets, but the removal and treatment of their wastes – subsidized from the public purse, why is it sensible or fair to demand of the poorest people on the planet that they pay for the whole operation themselves’ 192-3.

²⁰ Indian biogas plants, by contrast, have shorter detention times so if biogas sludge derived from sewage was used as a fertilizer, it could increase the spread of intestinal diseases (Dutta et al, 1997).

²¹ Mukhopadhyay is critical of Appadurai’s (2002) description of Toilet Festivals in Mumbai which links open defecation, ‘humiliation’, ‘victimisation’ and a lack of dignity in ways that are not necessarily shared by the slum dwellers themselves. Drawing on Appadurai’s work, Gay Hawkins observes that the “inability to establish distance from their own waste denies slum dwellers the most basic sense of dignity and status. Shit confirms their victimization and poverty” (66).