

## TAKING WOMEN'S BODILY FUNCTIONS INTO ACCOUNT IN URBAN PLANNING AND SUSTAINABILITY: SANITATION, TOILETS, MENSTRUATION

### ABSTRACT

This paper discusses global sanitation issues, in relation to girls and women with reference to toilet provision, menstruation and urbanization. Whilst over 2 billion people lack adequate toilet provision, water supply, sanitation and for that matter electricity, women are particularly badly affected. 50% of school girls in Africa leave school when menstruation starts because of lack of school toilets. Most women and men without toilets continue to defecate outdoors but women are particularly vulnerable. Over 50% of the world's population is urbanized and of those, over 50% of urban dwellers live in shanty towns and unregulated settlements, most of which are with any sanitation provision. Comparisons are made with the public toilet situation in Western countries, Women who have fewer facilities to start with, but more toileting needs, are especially badly affected. But public toilets are the missing link in creating sustainable, accessible and equitable cities. Lack of toilets has implications for health, hygiene, the needs of the elderly, disabled and children, as well as tourism, business and retail turnover. Many countries and large cities lack any toilet provision for women in the workplace, and no facilities are available for those travelling by public transport or foot. So better provision will increase women's access to the city, and result in their right to the city being fulfilled. Investment in toilets is not money down the drain. Likewise in the developing World provision of toilets, basic hygiene and water supply, reduces disease and improves health. Toilet provision is one of the last frontiers of gender inequality and this very basic issue needs to be integrated into urban planning policy, urban design and development priorities as part of gender mainstreaming programmes

Key words gender, menstruation, sanitation, toilets, cities

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### INTRODUCTION: WHAT IS THE PROBLEM?

Addressing the issues of sanitation and drainage –especially the lack of clean water supply – is a key component of the developing world agenda, along with sustainability policy and world health. But, much of the policy output is surprising non-specific, set at too high a level, and concerned with generic issues, related to generalised images of the world's population. There is little disaggregation from a gender perspective, as to the specific needs of, and implications for women, as against men. Furthermore international initiatives, policy statements and research about sanitation tend to major on 'water', and even when discussing water-borne disease, appear extraordinarily coy and too embarrassed to get into the specifics of human bodily excretion and its effect on water courses. Whilst faecal and urinary matters may sometimes be discussed within the context of human waste, menstruation barely seems to exist as an issue. Yet women comprise over half the world's population and at any one time, around a quarter of women of childbearing age will be menstruating. So there are several levels of neglect nested within the field of sanitation, namely an overall lack of recognition of the importance of toilet provision for women as well as men, but within that context, a failure to consider of the specific needs of women, and in particular a complete lacuna regarding all matters menstrual. But this is not 'just' a developing world issue, we need to look at overarching international attitudes to toilet provision and design. In particular the prevailing influence of developed countries, especially Western Europe from colonial times, casts its patriarchal shadow over the rest of the world. This still shapes attitudes towards the levels of toilet provision for women and men, the design of toilet facilities and the overall cultural awkwardness about addressing women's intimate toilet needs which so infects the sanitation, engineering and development professions.

### RESEARCH BACKGROUND AND TOILET DEFINITIONS

I came to doing research on toilet provision as a result of my long-standing interest in addressing 'women and planning' (geography and gender) issues (Greed, 1994). Undertaking research on the social aspects of planning policy, I soon found that 'ordinary people', especially women, in the UK were concerned about the

increasing lack of public toilet provision. As time went on I became very absorbed in creating a new field 'toiletology' bringing together both technical and sociological dimensions of the subject (Greed, 2004), which I still do to this day within the context of planning for accessible, equal and sustainable cities (Greed, 2011, 2012, 2014). To clarify public toilets in the UK (indeed much of the West) may be defined as comprising both traditional 'on-street', local authority public toilets and 'off-street' toilets to which the public has right of access, for example in restaurants or department stores, which, together, are better defined as 'away from home' toilets (BTA, 2001). Historically women have always had less toilet provision than men, whereas many other groups suffer toilet discrimination, including the elderly, those with small children, and people with disabilities. In fact I soon found all the dimensions of human life are components of the toilet agenda including gender, sexuality, ethnicity, class inter alia. Toilet policy is also central (although often unrecognised) across a wide range of high level policy areas, including health, development policy, social inclusion, religion and culture, environment, sustainability and so forth. Research by the Association of Town Centre Managers has found from studies of comparable sized towns, that those towns which have good public toilet provision actually attract more customers, tourists and visitors than those who do not (Lockwood, 2001). So far from being money down the drain, in addition to all the health, environmental and equality arguments, there is a strong business case for providing more public toilets, enabling tourists, shoppers and visitors comfortably to stay longer in a particular locality and spend more.

I have long argued that the importance of public toilet provision must be recognised within British town planning, whereas at present it is usually dealt with by technical departments such as 'waste management' or 'street cleaning' whose members have little understanding of social issues, let alone gender! If the government wants people to leave their cars at home and travel by public transport, cycle or walk, then the provision of public toilets is essential, especially at transport termini. Public transport passengers, pedestrians, and cyclists - unlike car drivers - cannot speed to the nearest motorway service station to use the toilet when they find the local public toilets have been closed. It should not be assumed that only a minority will need on-street public toilets, because alternative off-street toilet options are readily available. But still the overall image of the rail passenger, cyclist and even the pedestrian remains resolutely male and young, especially in environmental sustainability literature (Greed, 2012), and many so-called professional 'experts' seem to take this image with them when they win contracts to undertake work in the developing world too.

In many developing countries not only are there very few public toilets in the western sense, most households have no private toilets either, and so there are entire countries that are 'under-toileted' where open defecation and urination is the normal practice, with major implications for health and wellbeing. In discussing global toilet issues with WTO colleagues and comparing the situation in different members' countries, both developed and developing, I have concluded that the two situations are inextricably linked and we can't deal with one without the other. In this paper, first I provide some historical perspective on reasons for toilet under-provision for women. Then I look at the implications for the global toilet situation, and explain how lack of recognition of the importance of toilet provision affects the chances of successful implementation of the Millennium Development Goals (MDGs). The particular problems women encounter are highlighted including the neglect of menstruation issues and a disregard for the levels of female provision, and specific toilet design: all of which are likely to undermine the chances of achieving the MDGs and other global economic, social and environmental policies. Whilst the problem is dire for women in the West it is much worse for those in the developing world, and the arguments are even stronger for provision. For example from the business case perspective, providing toilets for women in developing countries may enable them to go to work or stay at school all day, or travel long distances to sell their wares at market, and thus increase the gross national product.

## THE HISTORICAL ROOTS OF UNDERPROVISION

The problem of unequal provision for women goes back a very long time and is still widespread in western countries too. For example, in England official government toilet regulations have historically, by law, given more provision to men than women, as stipulated originally under the 1875 Public Health Act. Industrial growth and prosperity had led to the building of our great towns and cities, brimming with a sense of civic pride, furnished with a range of public works and philanthropic amenities, including schools, hospitals, libraries, sewage and drainage works, and splendid public toilets. The only trouble was that most of the

engineers, architects and decision-makers were men, and they had very little concern with women's needs. The needs of women who comprise a major component of toilet users were never heard or understood.

But women need public toilets more than men (Penner,2013). Women are the ones who are more likely to be out and about in the day time, travelling on public transport more than men, and often accompanied by children or by elderly and disabled relatives (Cavanagh and Ware,1991; Gershenson and Penner,2009; Molotch and Noren,2010). It is well established from research that women take twice as long to use the toilet than men, because of biological considerations, and also because of the need to go into a cubicle and to deal with more clothing than men (Kira,1975). Nevertheless, typically women were provided with less than half the provision for men. Even if equal floor space is provided for the women's and men's side of a public toilet block, men are likely to have twice the number of 'places to pee' because a whole row of urinals can be provided in the same space where only a few cubicles can be fitted in. The under provision of toilets for women led to the toilet queue, and this was to have international consequences. As Michelle Barkley (toilet expert, architect and colleague) says, **'we exported gender inequality and toilet queues to the rest of the world'**, as the British Empire and colonisation grew apace. Even today Commonwealth countries have until relatively recently had the same building regulations, toilet standards and codes as Britain broadly based on BS6465 (BSI,2006). The Commonwealth is still influential as it covers 2 billion people and 20% of the world's land surface. For example, Malaysia (previously Malaya) has had to update their toilet standards and increase equality for women, in order to try and overcome these problems. Of course in some countries there are also pre-existing cultural and religious attitudes that have resulted in toilet discrimination against women, but patriarchal colonial toilet standards and regulations often made the situation worse.

In recent years in the UK we have sought to change the male-bias in the British toilet standards. We have created a completely new British Standard specifically on public toilet Provision entitled BS6465 Part 4: Sanitary Installations – Public Toilets (BSI,2010). This was also an opportunity to ensure the standard embodied changes in toilet technology and design, and to accommodate the needs of a wider range of user needs. Even in this day and age, many Commonwealth countries still take the lead from Britain when formulating their own building regulations and legal requirements, so our new toilet standard is proving influential beyond our shores. Gendered toilet change is occurring in other influential Western countries too. Nowadays because so many more women are educated and aware of that inequality is man-made, they are working and fighting for their rights, across the world. But there are still relatively few women in engineering, sanitation and design, who are knowledgeable about technical toilet standards. Nevertheless, in North America around 20 states of the USA now have 'potty parity' and attempts are being made to make this a federal-level requirement (Anthony and Dufresne, 2007). Likewise in Europe, in France, the government is taking toilet equality more seriously, influenced, in part, by the resurgence in popularity of the ideas of the philosopher Lefebvre regarding 'la droit à la ville' which means 'the right to the city', which should be equal for women and men. (Lefebvre,1968; Damon,2009). The right for women to have as much entitlement as men to access the city, to work, travel and walk around has been a major issue within the 'women and urban planning' movement for many years but progress has been very slow (Greed,2005). So it is to be welcomed that France declared in 2012 that all public toilets in France are to be free and more equal for everyone, residents, tourists, public transport users. However, equal provision in terms of facilities will take a while, and many French cities do not have much provision to start with. But the lesson is that in order to get better public toilets for everyone one must seek to achieve change at the highest political and attitudinal level within government, rather than fighting with local municipalities and providers who may not have the power, resources or inclination to make changes.

## THE INTERNATIONAL DEVELOPMENT CONTEXT

### The Millennium Development Goals

The toilet problems of the developed countries pale into insignificance compared with the situation in many developing countries which lack even the most basic toilet facilities. Over two billion people (a third of the world's population) lack adequate toilet provision (George, 2008). Women are particularly badly affected and this may be seen in part as the result of the colonial inheritance. Yet, the toilet issue is strangely disconnected from the mainstream development agenda. Research has demonstrated that public toilet

provision constitutes the vital, missing link that would enable the creation of sustainable, accessible, equitable and inclusive cities (Bichard et al, 2003; Hanson et al, 2007). The original definition of sustainability included environmental sustainability, but also social equality, health, well-being and economic viability (UN,1992) that is Place, People and Prosperity and toilet provision incorporates all these issues. The Millennium Development Goals, developed by the United Nations are eight in number and most have sanitation implications, especially number 7:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
- 3. Promote gender equality and empower women**
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
- 7. Ensure environmental sustainability \***
8. Develop global partnerships for development

View them at <http://www.un.org/millenniumgoals/>

**\*7c says, ‘halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.**

The provision of adequate toilets, especially for women, is fundamental to the achievement of the Millennium Development Goals, especially Goal 3: Promote gender equality and empower women, and Goal 7: Ensure environmental sustainability and especially Goal 7c as shown above. Many development agencies do not believe these have been adequately achieved and that many years of additional effort are needed. Since the MDG goals have fallen behind schedule, a new set of Sustainable Development Goals (SDGs) is being introduced which are more about the processes and methods of achieving the MDGs and so do not mention sanitation *per se* and so they are likely to fail too! Of the approaching 7 billion people in the world, around 2 billion lack not only toilets but accessible water supply, and electricity too, and in many developing countries such sanitation as exists is very basic. But it is argued that toilet provision is not a modern luxury but an absolute necessary in achieving world health and development (Black and Fawcett,2008). Over 50% of the world’s population is now urbanised, but a third of that number live in slums, shanty towns and unofficial settlements lacking the basics in terms of water and sanitation (Burdett and Sudjic, 2012 ). More people in the world have mobile phones than toilets, but toilets are not glamorous consumer items like phones or designer handbags! In high density mega-cities of South America, it is not necessarily lack of water supply or mains drainage that prevents everyone from having toilet provision and running water in their homes. Rather it is a matter of being able to afford to be connected to the system, not how close one is to the pipes, as in many countries you have to pay for privatised ‘public’ services (Mara,2006; Water Aid,2012).

### The Public Health Argument for Toilets

Why bother to do anything? Why care? Everyone, not just the poor, is affected by toilet inequality. In highly urbanised situations, as in the South American mega-cities, rich and poor often live in close proximity, luxury apartments across the road from shanty down development (Burdett and Sudjic, 2012 ). Flies and other vectors are no respecters of class or income and so rich people could be ‘eating other people’s shit’ as the flies fly over from the cess pits of the shanty towns and land on the food plates of the rich. Equally, all sorts of classic killer diseases, rampant in the developing world are water-borne diseases. They are transmitted by faecal contamination of water sources, exacerbated by poor drainage, standing water and simply locating the toilet in the wrong place upstream from the main drinking water source. In Africa 80%

defecate in the open, whilst world-wide over 1 billion do so (IIED, 2012). 60% of Africans do not have access to a toilet, and many will find other solutions such as ‘flying toilets’ (that is wrapping excreta in plastic bags and throwing it away). 80% of the children have worms and intestinal bugs and 1.5 billion people worldwide have round worms alone (Roma and Pugh, 2012). In India 90% of surface water is contaminated by shit and this is as much an urban as rural problem. Therefore Jack Sim, founder of the World Toilet Organisation (WTO), has launched a campaign entitled, ‘I care a shit’. Since sanitation is such a major issue, especially toilet provision, it is projected that one billion toilets are needed world-wide. But, it is not just a matter of building more western toilets, particularly in locations where there is no sewerage system or water supply to service the toilets. Dry toilets, ecological pit toilets, and low tech toilets are the way forward, especially since poorly-maintained water-based systems actually spread disease. Provision of basic toilets, hygiene and water supply would of itself reduce disease and increase health, arguably far more than expensive western technologies, medicines and drugs. Washing your hands after using the toilet is such a basic, cheap, public health measure but this cannot be done if there is no water supply. There should be international support for such measures, but in reality it is often NGOs, local communities and voluntary self-help groups that are working for change, and the topic is simply not ‘sexy’ or prestigious (Black and Fawcett, 2008). Politicians and advisors prefer to drone on and on about the importance of sustainability, health and economic development, but seldom link these factors to the harsh and dirty realities of everyday shit-shifting, overall excreta disposal, menstruation and basic toilet provision.

## WOMEN’S SPECIFIC TOILET NEEDS

### Menstruation, Menstruation, Menstruation

To paraphrase a past British Prime Minister who argued that ‘education, education, education’ was the most important thing for the progress of the state of Britain, menstruation is an equally important issue that must accompany educational policy in the developing world. All the above generic toilet factors are very important for the entire population of the world. But we still need to give greater attention to the specific needs of women. Girls in many developing countries have to stay away from school every month when they are menstruating because of lack of school toilets. **50% of girls in Africa do not continue with school because of lack of toilets.** Around a quarter of all women of child-bearing age will be menstruating at any one time, and every month up to 5 days will be lost in terms of school attendance. Locally-made, menstrual bracelets are being given out to school girls in Durban to raise consciousness, each bracelet has 28 beads, 5 of which were red for the menstrual period. So provision is fundamental to achieving all the other equality and developmental objectives. Significantly, in spite of this specifically gendered problem arising at secondary school level, as shown above the MDGs only refer to increasing gender equality at primary school level (Goal 2) and ignore menstruation completely.

The lack of toilet facilities and adequate washing and disposal facilities, during their menstrual period, along with lack of privacy results in girls leaving school. Additional problems are the unequal level of provision of toilets for school girls, and the lack of privacy, indeed often there are no separate toilets for girls and women. Men can go anywhere whereas women are always vulnerable to potential attack, humiliation, loss of reputation, wild animals, snakes, and so forth if they go in the bush. It may be too far to go home, and if they so set off they may give up and not return to school the same day. This was all explained to us by school girls themselves from the Equisweni Primary School, Durban, at the WTO conference in South Africa. A group of school children, mainly girls, came on the stage. They gave their heart-rending personal toilet testimonies, explaining how school toilets improved their educational prospects. We were shown some truly grim, primitive power points photos of terrible toilets, just a hole in the ground surrounded by corrugated broken sheeting, with no hand washing or privacy. 80% of schools in South Africa only have pit toilets and many lack adequate facilities for female pupils and teachers. This helped change the atmosphere and culture and enabled such matters to be discussed. **Indeed menstruation became one of the one key topics throughout the conference, breaking yet another taboo.** It was said that ‘menstruation’ is now at the point of recognition that toilets were in 2001 when the World Toilet Organisation started.

The open discussion of menstruation at toilet conferences is a real breakthrough in the toilet wars! Amanda Marlin, a health expert working on sanitation in Africa, made the very interesting point that women are disadvantaged if their needs and existence are never recognised, that is if there is no empirical evidence

collected on women. Indeed lack of data is itself a sign of discrimination. Women are just plain invisible. There are parallels with the British and American public toilet situation in that women's needs are so often ignored as there is no gender differentiated data on their needs, or the male is taken as the 'norm' and women are just an irritating addition, best ignored, or seen as an extra expense. From this male-mind-set flows all sorts of problems such as women being charged for toilets and men not, queues for women's toilets, and in the developing world a disregard for women's modesty, privacy, fear of attack, and lack of consideration of menstruation issues.

Whilst it is very important that menstruation is recognised as of key significance in achieving gender equality and MDG goals, we cannot assume that the solution to all the problems is a western-style one. Are western disposable sanitary pads and tampons appropriate? Saskia Casteltain who has been working with the UN on menstrual hygiene, argues that if every woman used western sanitary pads and tampons it would create such a pile of waste for disposal that it would be far higher than the disposable nappy mountain. Washable pads that can be recycled are essential, especially since many girls and women simply cannot afford western products, and the sewerage system cannot cope with them either. But one must also be wary of other ostensibly more environmental solutions. The Moon cup, which is inserted to collect the menses blood inside the woman, has been heralded as the ultimate green sustainable solution. But in many cultures inserting tampons is forbidden because of virginity and purity laws. Many millions of women who have experienced Female Genital Mutilation (FGM) are unable to do so in any case. It would seem that home-made, washable cloth napkins and towels are a better solution, but even then some girls and women are too poor even to use this solution. But the big multi-national sanitary wear and paper-products companies see the developing world as a massive new market for all sorts of disposable items including tampons, pads, wipes and of course toilet paper and are even willing to give away free samples to get people hooked on these productions. So the solution is never that simple and the most important thing is to talk to the local girls and women and find out what they want, what they can afford and what they cope with themselves.

### Women's Health and Toilet Cleaning

In an ideal world not only would there be toilets for girls and women, but they would be clean, well maintained and well designed. Dirty, unsanitary toilets, are a worldwide problem, albeit to a lesser degree in many developed countries too. One of the main means of transmission of many classic diseases and many urinary, vaginal and anal infections is from human faeces; therefore it is extremely important to provide adequate, hygienic public toilets (Greed,2006). In public toilets, complete strangers mix and use the same sanitary facilities, with all the related risks of bodily fluid exchange, contamination and organism transmission. Deslypere (2004) has demonstrated that the chances of pathogen transmission are very high even in toilets that may appear to look clean, as every door handle (especially the last one out to the street), tap, lever, flush, lock, bar of soap, toilet roll holder, turnstile, is a potential 'germ' carrier. (The generic term 'germ' is used to include virus, bacterium, pathogen, microbe, parasite, fungus and so forth.) Ostensibly, hygienic equipment, such as electric hand-driers (often imagined to be safer than towels) may blow germs back into the atmosphere. Their use can contribute to the spread of Legionnaire's disease, which is transmitted through contaminated air (Rothburn and Dunnigan,2004,p 65-6). Flushing the toilet can also result in mini-droplets of contaminated air passing into the respiratory system (Deslypere, 2004). But because of women's more 'open' anatomical design all these issues are magnified compared with men, especially when women in many parts of the world will sit or squat and touch the toilet, whereas men can just stand back and urinate.

Many of these issues can be improved by better cleaning regimes and basic hygiene. One must go back one step more and to consider the role of design and ergonomics in preventing contamination. For example the installation of touch-free, flushing sensors and door-opening mechanisms, along with automatic washing, soap dispensing and drying systems (such as air blade hand dryers) reduce chances of contamination, but at the same time require higher levels of maintenance and surveillance to avoid vandalism and mechanical breakdowns. So it is not just a matter of providing new shiny toilets furnished with the latest high-tech equipment and then leaving them to care for themselves. Basic cleaning and hygiene is also absolutely necessary. It is a major mistake to introduce high-tech modern western toilet equipment and then not to maintain it and no readily-available replacement parts. Maintenance and health-wise a hole in the ground type toilet is more sustainable than some fancy western 'sit down' version. It is essential the local people can

have a sense of ownership of the toilet facilities and that they are willing and able to maintain, clean and manage them. There are so many examples of well-intentioned organisations donating western toilets to developing countries that end up un-used because they break down, they offend local taboos and make women feel vulnerable, or indeed they are seen as unhygienic by the local people used to going outside.

### Poor Toilet Design

More deadly but less 'obvious', and heavily gendered, are the effects of poor toilet provision and design. Research has shown that referrals for urinary tract infections, problems of distended bladders, and a range of other uro-gynaecological problems have increased proportionately to toilet closure. The chances of streptococcal toxic shock syndrome from sanitary protection is increased if there are no toilets available to change tampons during menstruation (Armstrong and Scott, 1992; Rothburn and Dunnigan, 2004, p 79). Changing facilities are also needed by men and women suffering urinary and anal/faecal incontinence. Absolutely hygienic conditions are needed for changing colostomy bags (for faecal waste) along with good lighting, shelves to put equipment on, and hot water supply (Hanson et al, 2007). Public toilets may also offer baby changing facilities, another activity requiring cleanliness both for the baby and mother, requiring adequate washing facilities and disposal bins to ensure that subsequent users are not confronted with unsanitary conditions.

But good design is not a universal absolute, much depends upon local customs and what people's muscles, bladders and bowels are used to. Women need to sit down to use the toilet (at least in the West) but have difficulty doing so because of narrow cubicle design, whilst the positioning of the sanitary disposal bin or jumbo-sized, toilet roll holder may restrict sitting space even more. **The low priority given to menstruation, by the inclusion of a plastic disposal bin as an afterthought, speaks volumes about the lack of recognition of the importance of menstruation in the West, let alone the problems in the developing world.** Women are also concerned about 'catching germs from the toilet seat' (Salley, 1996). Both men and women views toilets as sites of crime, dirt, disease, sex and disorder (Cockfield, 2001). Studies have long shown that around 80% of women 'hover' over the seat to urinate when in public toilets, whereas they prefer to sit when using their toilet at home. Hovering contributes to residual urine retention, as the bladder cannot empty properly and thus to the development of continence problems (Kursch and McGuire (ed) 1998; Parazzini et al, 2003). Research has found that crouching over the bowl reduces urine flow by 21% and increases by 150% the chances of residual urine remaining in the bladder. So again it is a matter of design as well as hygiene that together create healthy public toilets.

There is much debate about the best position, for women, to urinate, and but generally a simple squatting position (as in Eastern toilets) is probably the most natural and effective. *'But why can't a woman be more like a man?'* There have been various attempts to design a female urinal, or urinette, such as the Lady Pee. They have proved unpopular with women and are problematic in an ageing society. Gender remains a major determinant of toilet design (Gershenson and Penner (eds) 2009). Of course most of the world's population squat to use the toilet, and this is actually a more ergonomic solution, but international sanitary ware manufacturers have convinced the world that it is backward to squat and modern and educated to sit! The sit/squat debate is always a major issue at world toilet conferences, but it is often forgotten that women have to sit (or squat) to urinate, whereas men usually stand to urinate. Likewise most of the world's population use water not toilet paper to clean themselves after defecating, and most of the world's population cannot afford such luxuries as paper.

As people get older their toilet habits may change, with increased frequency of urination, along with various mobility issues, all of which present new design challenges. Narrow cubicles and inward opening doors restrict access, and it could only be front-facing urinators (men) that could design such small cubicles! Women have to get into the cubicle, close the door and then do a three point turn to sit on (or over) the toilet seat. But given the gendered nature of toilet provision there is usually not enough space. This is a common scenario in the many western discussions of toilet provision and design. But it should be remembered that in many developing countries, the majority of the population are under the age of 30, and the ageing problem has not yet reached them. In fact in many countries the majority of the population comprises, children, teenagers and women, but one would not think so from the media. Disability is another major issue in toilet

design in the West, especially for elderly disabled women. But in many developing countries survival rates are lower, and the main cause of disability (and male deaths) is actually war, resulting in greater numbers of younger male disabled people, another challenge for toilet designers.

The issue of racial discrimination adds another dimension on top of gender, in terms of toilet availability and levels of provision. Race has long been a major factor in toilet provision in countries where there has been a history of apartheid and segregation. For example, Barbara Penner (Penner,2013) has highlighted the racial aspect in the USA, as follows. In 1961 in Jackson, Mississippi, a black woman, Gwendolyn Jenkins, was arrested for her attempts to desegregate public toilets, by trying to use the white women's toilets. We never hear of her, but she was the toilet equivalent of Rosa Parks who sat in the whites-only section of the bus and is credited with igniting the black movement in America. This all may seem distant history now but having visited post-apartheid South Africa there are still many lessons to be learned, and less obvious manifestations of inequality to be tackled, especially for women. But nowadays the situation is more subtle with divisions based not only on colour but also on class, income, location, professional status and of course gender. Toilets for ex-pat white people are generally very different from those for the local black people, whereas those in tourist hotels are often comparable to standard Western toilets. So again toilet providers and designers, need to take these qualitative issues into account, as well as quantitatively increasing the numbers of toilets overall.

## THE WAY FORWARD

As a basic principle, it is essential to deal with the issue of lack of toilet provision at the highest level of government possible and to mainstream (integrate) toilet policy into higher-level urban planning and policy making, rather than leaving it to technical and operational departments. But, equally, gender must also itself be mainstreamed into all toilet decision making, standards setting, design decisions and levels of provision. But gender must not be treated as an abstract disembodied concept, it must be related to the realities of the differences in bodily functions between men and women, including an acknowledgment of the huge differences (from men) in respect of menstruation, pregnancy, breast feeding, incontinence, inter alia. Rather than looking to the West, the East might provide better guidance and examples on toilet provision in the developing world. There has been a restroom revolution in many of the emerging Tiger Economies of the Far East, many going from a 'hole in the ground' society, to a high-tech toilet society in one generation. But most toilets within these countries are still squat toilets rather than sit toilets, albeit linked to advanced environmentally sustainable waste disposal systems, and well maintained, frequently cleaned and respected by the local population. The World Toilet Organisation and its sister organisations, including the Japan Toilet Association and Taiwan Toilet Association, and similar organisations in China, Malaysia, Singapore and Malaysia have all taken toilet provision very seriously, and their governments have invested strongly in toilet provision and new infrastructure (Miyanashi 1996). In many of these countries female to male ratios of toilet provision in public toilets are on the basis of 2:1 in favour of women, even 3:1 in some tourist areas in Japan. They see toilet provision as a sign of progress, modernity and science, (like computers) as well as embodying civic pride and civilised principles.

There are parallels with Victorian England when huge investment in public facilities such as schools, hospitals, museums and public toilets were seen as an essential manifestation of civic pride, and a reformed society. In the West nowadays, as a result of the financial crises and government cut backs this inherited infrastructure is crumbling and the value of 'social goods' such as toilets and other local facilities is no longer understood in terms of creating a socially, environmentally and economically sustainable society. But this toilet provision needs to be adequate and appropriate to the local situation and not a copy of our peculiar approach to toilet design and our outdated solutions to human waste disposal. It is very strange to throw away some of the most valuable resources on the planet, urine and faeces, which for centuries were greatly valued as fertiliser, building materials, fuel and the source of all sorts of useful chemicals. But this is changing, for example at Bristol, there is a project underway to generate electricity from urine, using simple technologies, which might be used in African villages, yielding electricity for lighting and clean water (Ieropoulos, 2011). For the future there are so many possibilities once society gets over its traditional negative attitudes towards toilets, human waste, especially menstruation, and, for that matter, women.



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