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**40<sup>th</sup> WEDC International Conference, Loughborough, UK, 2017****LOCAL ACTION WITH INTERNATIONAL COOPERATION TO IMPROVE AND SUSTAIN WATER, SANITATION AND HYGIENE SERVICES****Urban sanitation: where to next?***P. Scott, R. E. Scott & A. P. Cotton***PAPER 2832**

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*This paper sets the current research-related innovations in urban sanitation of low to middle income countries within a broader historic context. It highlights the key threads of urban sanitation discourse over the past four decades; from putting the last first, to a more nuanced understanding of household demand and uptake, and a focus on faecal sludge management (FSM). Particularly since 2008 the International Year of Sanitation, there has been increasing specialisation around the sanitation value chain and FSM, producing deeper knowledge and several diagnostic / decision support tools. Whilst the sector has, in no doubt, made great progress, the paper suggests that there is a risk of (over)simplification. Now is the time, armed with a better understanding and decision support tools, to embrace urban complexity; to place sanitation back into the wider human-technology-environment systems of the city; and to plan for integrated basic services in the domestic and peri-domestic domains.*

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**A brief history of urban sanitation**

The purpose of this paper is to set the current research-related innovations in planning and implementation of urban sanitation for towns and cities in low/low-middle income countries within a broader historic context. The preceding efforts of research and programming over 30-plus years offer important lessons concerning what worked, what didn't work, and how gaps in the sector's understanding were identified and have relevance for future progress.

**Putting the last first (1980s-1990s)**

Prior to the 1980's, much international development effort was characterised by top-down approaches. Sanitation was largely absent from the development agenda, so much so that it only narrowly made it into the International Drinking Water Supply and Sanitation Decade (IDWSSD) 1981-1990. The advancement of the 'Sustainable Livelihoods Approach' (SLA) marked a shift away from the top-down approaches of development to bottom-up, grassroots and "putting the last first" (Chambers 1983). A significant feature of the 1970s and 1980s was the bundling of improved service provision, including sanitation, within shelter improvement programmes. These included *inter alia*: housing development, sites and services, and area upgrading/slum improvement. Attempts to provide housing through government projects with associated basic infrastructure proved neither effective in meeting the shelter needs of the poor, un-economical and unsustainable (The World Bank 1974). Nevertheless sanitation was treated as part of *wider service improvements* at the settlement level that benefited the living environment. Government agencies withdrew from direct construction to technical support and this led the way to introducing demand for shelter improvements and to locating development control at the local neighbourhood or community level (Wakely 1988). This was subsequently accompanied by a technical support approach to service provision which dispensed with the top-down provision of standardised (and unaffordable) services (Cotton & Franceys 1987; 1991).

In Karachi, Pakistan for example, the Orangi Pilot Project (OPP) embarked on a number of programmes in 1980 that included impressive achievements in tertiary level sewerage through self-help and social action. Importantly, this was not exclusively about sanitation: production of building materials and social programmes were part of OPPs aims to promote community organisation and demonstration using a very open-ended approach (Khan 1992). The Calcutta Slum Improvement Programme, a large multi-sector

programme that included infrastructure and sanitation, primary health care, enterprise development and pre-school education found that slum residents prioritized an “*increase in streets and open spaces free from mud, garbage and excreta*” and “*a sense of security, easy mobility and reduced drudgery especially for women*” (Kar 1997). In short, it became apparent that it is the overall impact on the totality of peoples’ lives that matters, rather than isolated service interventions. Similar multi-sector programmes with a strong community focus were reviewed by Cotton and Tayler (1994).

### **Demand (1990s)**

Cotton and Franceys (1988; 1991) introduced the concept of demand across the whole range of urban services, using a successive upgrading approach that built on the sanitation-related work of Kalbermatten et al. (1980). Little attention had been paid to consumer demand for services (Whittington et al. 1993a) until, in a paper that is as relevant today as it was 25 years ago, Cairncross (1992) identified the importance of responding to demand in sanitation programming as a major lesson to emerge from the IDWSSD. A body of evidence thus started to build around why people want toilets (Jenkins & Sugden 2006); user perceptions of sanitation (Saywell 2000); and peoples’ preferences, intentions and ability to choose sanitation (Jenkins and Scott 2007). Sanitation Marketing principles were advanced as the mechanism to ‘unlock sanitation demand’ (Budds et al. 2002). Meanwhile, integrated urban development programmes continued to reinforce the analysis of Cairncross (1992) and Kar et al. (1997) that sanitation is rarely a high priority in the perceptions of residents.

### **Appropriate sanitation technology (1990s)**

Prior to the 1990s, many believed that the most appropriate sanitation technology choice for urban areas was piped sewerage. Whilst reduced-cost sewerage in Africa, South Asia and South America offered networked sewerage at lower cost than conventional sewerage (Reed 1995; Mara 1996), Cotton and Saywell (1998) found that on-plot sanitation was in fact an appropriate option in many urban settings. The lack of any central planning for sanitation in many cities meant that responsibility fell to the household, for whom on-plot options were the *de facto* choice. Concurrently, the environmental sustainability movement spurred the emergence of ecological sanitation (EcoSan) (Esrey et al. 1998). The more prescriptive technology associated with the development of EcoSan fundamentally conflicted with the demand-led movement elsewhere in the sector and the two approaches seemed incompatible. This caused considerable divisions.

### **Urban sanitation planning frameworks and the enabling environment (late 1990s-2000s)**

*The Strategic Sanitation Approach (SSA)* developed by Albert Wright and the World Bank (Wright 1997), is a demand-based sanitation planning framework whereby different technologies are used in different areas of a city, for which different groups of both public and private sector actors take responsibility for service delivery and management. Herein, Wright introduced the New Institutional Economics (NIE) terminology of *incentives* and *transaction costs* to sanitation.

*Household Centred Environmental Sanitation (HCES)* an alternative urban sanitation framework developed by WSSCC, also in 1997, placed the household at the centre of the urban environment in a ‘domain’-based planning approach which cascaded outwards through ‘neighbourhoods and ‘districts’ in a geographic sense. It included the NIE terminology of the enabling environment and also looked more widely than sanitation, including solid waste management and drainage into the framework (Kalbermatten et al. 1999). Later variants in the form of Sanitation 21, were published by the IWA (2006) and jointly IWA-EAWAG-GIZ (Parkinson et al. 2014).

Tayler et al. (2003) attempted to apply a strategic approach to sanitation planning which in practice involved elements of both the SSA and HCES. Working in the Indian city of Bharatpur, they identified barriers to change arising from the lack of recognition amongst decision makers of the importance of urban sanitation and an unresponsive institutional culture lacking strategic planning.

The realities of the provision of urban basic services were becoming more apparent: including that most latrines were largely self-built rather than provided through government action. The work of Collignon and Vezinea (2000) also identified the huge importance of independent non-state service providers: the small-scale entrepreneurs who offered basic services in water, waste and sanitation.

### **Since The International Year of Sanitation (2008 onwards)**

2008 was declared the International Year of Sanitation (IYS) in recognition of the crisis point that sanitation, particularly in cities, had reached. There had been some significant progress in sanitation. On-plot sanitation

had become more widely accepted as the most prevalent form of sanitation for the foreseeable future (Cotton & Saywell 1998); notably the 2002-2005 PAQPUD project in Senegal (sanitation improvement programme for peri-urban Dakar) marked the first time on-plot sanitation and faecal sludge management (FSM) were integrated into a national sanitation strategy and in 2006 a multi stakeholder Symposium was held on FSM in Senegal (Koné et al. 2006). But at the start of IYS there remained many unanswered questions in urban sanitation: *what to do when latrine pits filled* was a recurrent issue (appropriate FSM technology and service chains were not well understood or indeed present); *demand* was proving more complex than originally thought (Whittington et al. 1993a); and it became clear that sanitation marketing could not stimulate demand for everyone (Mulenga & Fawcett 2003; Jenkins & Scott 2007). *Tenure issues* were identified as a conflicting problem in planning and access to sanitation (Wegelin-Schuringa & Kodo 1997) and the *power dynamics* within communities meant interventions were often influenced by the more powerful members rather than the community as a whole (Vajja & White 2008).

Further work brought some clarity: Godfrey (2009) highlighted that the lack of appropriate pit emptying technologies (along with the lack of enabling environment and effective policy and regulatory framework) prevented small-scale sanitation service providers from upscaling their emptying services. Scott unpacked some of the relationships between tenure and sanitation (Scott 2011) and distinguished between the *willingness to invest* in sanitation infrastructure and the *willingness to pay* for sanitation services (Scott et al. 2013). Mazeau identified an array of shared sanitation typologies (Mazeau et al. 2013) and that cleanliness and affordability are key determinants when urban dwellers select between shared toilet facilities (Mazeau et al. 2014). The private sector became the mechanism of decentralised sanitation service delivery and there was a surge of interest in sanitation business models, specifically affordable and innovative sanitation technologies for the poor (O’Keefe et al. 2015). Innovative financing mechanisms were also being sought and Patel (2015) reported some success in co-financing of sanitation infrastructure with slum/shack dweller associations.

Conceptually, since 2008, the sanitation service chain model i.e. *capture > emptying > transport > treatment > end-use/disposal* became standard terminology to describe the components in the chain of urban sanitation activities, also referred to as FSM. The enabling environment and political economy was also becoming prominent. Community Led Urban Environmental Sanitation (CLUES) - an evolution of HCES - (Lüthi et al. 2011) included a stakeholder and enabling environment analysis; Kennedy-Walker (2015) underlined the importance of these analyses. Scott et al.’s (2015) *Sanitation Cityscape* overlays the linear service delivery model of FSM onto domains of domestic; service delivery and citywide planning (*aka* the enabling environment), similar to the domain conceptualisation of a city of HCES and Sanitation 21, and suggest these are in fact complementary to conceptualising a more complex urban environment. Sanitation Safety Plans (SSP) were also introduced as a risk-based management tool to identify and monitor hazards caused along the sanitation chain (WHO 2015).

The World Bank Water and Sanitation Program (WSP) developed and tested diagnostic and decision support tools for urban sanitation: Peal et al. (2014) operationalized concepts from (1993b), Collingnon and Vezina (2000) and Scott (2011) to map the sanitation pathways of faecal sludge on a citywide scale (commonly known as excreta flow diagrams, or SFDs) and also applied the analysis of the enabling environment in the Service Delivery Assessment (SDA) tool. These, along with other tools, were tested using primary data and validated (Ross et al. 2016). In the view of the authors (at the time of writing), these WSP diagnostic tools and Guidelines offer the clearest framework and systematic view for understanding the complexities of urban sanitation; crucially, they take account of the informed realities of the enabling environment and what is *do-able* in a particular urban context.

### **What have we lost?**

Our understanding of urban sanitation issues has come far. We have gained a more nuanced understanding of the drivers and barriers surrounding sanitation uptake at the household level. Work has focused on household demand generation through social marketing and beyond the household there has been a major upsurge of work in FSM. This has led to increasing specialisation, for example in techniques to generate household demand; greater awareness of what happens ‘beyond the toilet’; and the use of tools to track, for example, faecal sludge along a service chain. This said, the authors caution against tools such as the SFD being used indiscriminately such that steps towards detailed urban sanitation planning becomes a ‘tick box exercise’ where activities are identified for each stage of the FSM / sanitation chain with little accompanying analysis of the wider political economy, institutional or enabling environment – the key constraints to urban sanitation identified by earlier work; e.g. Tayler et al. (2003).

The urban environment is vastly complex and sanitation is recognized as one of the more complex basic services due to the intertwined nature of the human-technology-environment system it presents. The sanitation service chain / FSM model is intentionally simplified and linear, describing the key stages of a service delivery chain. It has been hugely instrumental in the past decade's advances. Whilst not criticising the model in itself, through its widespread uptake, it has become the *de facto* conceptual framework for much research and development in urban sanitation, yet it does not include the wider issues highlighted in previous urban sanitation models. Whilst we have increased our knowledge of the specifics of urban sanitation, we suggest that this has come at the expense of grasping the inherent complexity of urban sanitation in the context of 'managing the city'.

### **People-centred development and user preferences**

*People* who were strategically placed at the centre of urban sanitation frameworks two decades ago, are now missing from the linear FSM framework. We know from experience that focusing on the technology alone is flawed, while the FSM model describes technologies and logistics yet omits user preferences, behaviours and decisions that we have learnt are fundamental to getting sanitation right (Cairncross 1992). Both HCES, its successors, and the SSA, recognise the centrality of demand and the existence of important boundaries between the domains of the household, the neighbourhood or community, and the wider city. The reality of urban living (not just low-income) is that the boundaries of services and households are far more complex with several 'household' units living under one roof or in one compound, with shared bins, standposts and toilets; i.e. in a peri-domestic zone. Elements of complexity in the peri-domestic domain involve the interactions between different services sectors; planning for one service (e.g. sanitation) cannot proceed in isolation from others, e.g. water supply, drainage and so on (Cotton and Franceys 1988, 1991). Further, the modes of implementation for sanitation are different from other infrastructure and services due to the (often latent) nature of demand. Nevertheless, there arises the uncomfortable reality of how service improvements are perceived by residents: sanitation is important to residents *but so are many other services*. We suggest that these interactions and interfaces of servicing the peri-domestic level are part of the complexity and, (as they are not explicitly mentioned in the FSM model), risk being overlooked. What therefore is the balance between a fully bottom-up response to demand across the full range of basic services in relation to promotion of demand for one specific service?

### **Conclusion - where do we go from here?**

The last 35 years have been witness to major advances in urban sanitation services. Moving from purely top-down, supply-driven approaches typified by urban housing programmes of the 1970s, major advances have been achieved in addressing user demand. Important innovations arose through the concepts from new institutional economics and also through lessons from the field in terms of putting people at the centre of development. These gave rise to usable planning frameworks that identified the centrality of the enabling environment, helping us to identify *why* things are like they are. In other words, these were recognising complexity, hinting that a reductionist approach could only lead so far.

The concepts of a value chain for sanitation moved urban sanitation thinking beyond the household and FSM moved centre stage, rightly giving prominence to a hitherto neglected aspect of the city-wide nature of sanitation. It has, unintentionally, become the *de facto* urban sanitation planning framework; where in fact it was never intended as such. Urban complexity is addressed by the most recent developments with city service delivery assessments, bringing together the analysis of the enabling environment with the local political economy. FSM and its tools make sense within this context, but must not be taken in isolation.

There remains the need to integrate these latter developments with the improved understanding of the household and peri-household domains. We must remember that it is the impact on the totality of peoples' lives that matters rather than isolated service interventions and, in this respect, we recognise the centrality of responding to demand in a holistic sense. We therefore suggest reconsidering earlier approaches to *integrated service provision* for the peri-household environment, of which sanitation is but one component. We suggest that we need to revisit frameworks such as HCES, CLUES and the *Sanitation Cityscape* that bring together integrated service provision, and critically are underpinned by an appreciation of the complexities, approached through the enabling environment and political economy analyses.

Now is the time, armed with a better understanding of urban sanitation, several decision support and diagnostic tools and more mature urban sanitation conceptual frameworks, to move beyond the linear

(over)simplification of urban sanitation and place sanitation back into the wider and complex human-technology-environment systems of the city.

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