



User perceptions in urban sanitation

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IN FEBRUARY 1998, the Water, Engineering and Development Centre (WEDC) published the findings from three years investigation into on-plot sanitation¹ in low income urban communities (based on a Department for International Development (DFID) funded research project (R4857), *On-Plot Sanitation in Low Income Urban Communities*). This work raised some interesting points regarding discrepancies between user and sector professionals' assumptions about the appropriateness and efficacy of household latrine sanitation systems. This paper discusses some of these issues.

Background

The Phase 1 literature review for the project highlighted a feeling amongst some authorities and sector professionals that whilst on-plot sanitation was appropriate for rural areas, it was generally unsuitable in the urban context, unless viewed as a (preferably short-term) route to 'better' forms of sanitation. However, this analysis did not appear to be based on an examination of the performance and sustainability of on-plot sanitation. Given the fact that on the ground on-plot sanitation is widespread in urban areas, this project sought to investigate some of the key issues of concern through field investigations in India (Vijayawada), Mozambique (Maputo) and Ghana (Accra, Cape Coast and Tamale). In particular, the project addressed several key questions to emerge during the Phase 1 review and postal survey, which included:

- What are the reasons for the absence of household sanitation?
- Will users be satisfied with on-plot solutions to sanitation?
- How does plot size constrain the use of on-plot sanitation?
- What operational problems arise with on-plot sanitation?

The research employed several different methodological tools simultaneously. Ghana, Mozambique and India were selected for fieldwork visits on the basis that these countries would afford cross-cultural and technological comparisons. Arrangements were reached with several research partners (NGO's, government departments, municipalities) to collaborate on the research and to provide the necessary in-country inputs of resources to conduct appropriate fieldwork. The majority of the data collected was elicited through household surveys (1843 in total). In each country, local field workers, known by the communities in which they worked, were employed to collect data using a

locally agreed and pre-tested questionnaire survey sheet. The selection of districts surveyed was ultimately left to the discretion of collaborating agencies, but conformed to certain criteria required for the project.

The most important feature of the investigation was that it focused on the *perceptions* of the users of on-plot sanitation. All too often, assessments and judgements on effectiveness and appropriateness are made from a technologically biased and purely external perspective. One can observe that many evaluations are done by those who are hardly likely to themselves be regular users of improved pit latrines. Thus, most attention has focused on an attempt to establish what the concerns of the users of on-plot systems were in urban areas and to reflect these in guidelines for selection.

Findings

User satisfaction

Perceived user benefits of sanitation

As a proxy indicator of perceived benefits of sanitation, the household survey asked each family, '*Why did you build a toilet on your plot?*'. The results tended to reinforce the finding that socio-cultural, rather than health factors dominate user decisions to invest in domestic sanitation facilities. Factors including 'comfort and convenience' and 'privacy' account for just under half of all responses (48 per cent). 'Health' accounts for 11 per cent, and other significant minorities include 'government sponsored' (8 per cent), 'no/poor public facilities' (5 per cent) and a combination of comfort/convenience and privacy (5 per cent).

Expressed levels of user satisfaction

Table 1 below shows the aggregated responses to the question, '*How satisfied are you with your toilet?*'. The results indicate high levels of expressed satisfaction (83 per cent or more recording 'very satisfied' or 'satisfied') for five of the six latrine types listed. Only bucket/pan latrines show significant levels of dissatisfaction, with just under half of all cases listed as 'unsatisfied' or 'very dissatisfied'.

Problems with operation and maintenance of latrines

In response to the question, '*What problems do you have with your toilet?*', it was significant that in over half of all cases (54 per cent) there were 'no' problems with the latrine. Where problems were recorded, difficulties with 'emptying' were the most commonly noted minority (12 per cent), with 'smell' and 'insects' recording 7 per cent and 4 per cent respectively.

Table 1. Levels of expressed user satisfaction by technology type

Table 2 below carries a comparison of the most frequently noted problems by technology type. This table reflects the overall picture noted above. An important aspect to note is the high percentages recorded under 'none' for five of the six latrine types tested, with only bucket/pan latrine types recording less than 50 per cent in this category. Additionally, the percentages recorded for smell and insects are relatively small, as compared against those recorded for emptying.

When examining individual technology types, several points of interest are observable:

- Simple pit latrines record the highest percentage figures of all types under the 'none' category; while VIP latrines record the second lowest;
- Pour-flush latrines, even with their waterseal, record insects and odours amongst the most commonly noted operational problems. However, only 36 per cent of users perceive odour nuisance to be greater than 'slight';
- Bucket/pan latrines frequently record 'emptying' problems from its users;
- 'Lack of water' is only mentioned in relation to WC to septic tanks.

What the above comparison does provide is an indication of the relative problems experienced by users of individual

technology types, but what is not clear is the impact that these problems have on the user's satisfaction of their latrines. Cross-tabulations between these two variables are informative in that they indicate which of the above problems have the strongest impact on satisfaction levels. Examining the percentage of cases that fall in the two most dissatisfied categories indicates that of the six most prominent problems listed above, only 'emptying' and 'smell' impact significantly on dissatisfaction levels (defined here as larger than 1.0 per cent of all cases).

Cross-tabulations between recorded problems and their perceived impact on continued use of the household latrine reinforce this point. Of the problems identified, only 'emptying' and 'smell' account for a cumulative figure of more than 1 per cent of all cases in the three categories indicating more than a moderate impact on continued use of the latrine.

Key findings

- Household decisions to invest in domestic sanitation are typically driven by socio-cultural rather than health factors;
- In all but one case, users express high degrees of satisfaction with their latrine (in excess of 80 per cent recording 'satisfied' or 'very satisfied'). Bucket/pan latrines record by far the highest levels of dissatisfaction;

Table 2. Most commonly noted problems with latrine by technology type

- Many users do not perceive there to be a problem with their latrine. Where problems are recorded, the most common include 'emptying', 'smell' and 'insects', although absolute figures are low;
- Of these three problems, 'emptying' and 'smell' have the most impact on satisfaction levels and ability for the user to use the latrine.

Odour and insect nuisance

Background

Complaints about pit latrines most frequently mention odours and insect nuisance, yet there are few specific references to ways of overcoming these nuisances in urban areas. Flies are a serious problem because they spread disease through feeding and breeding on faeces. Some types of mosquitoes (the *Culex* variety) breed in polluted water such as in wet latrines and may carry the disease filariasis. Reduction of smells, flies and mosquitoes are therefore of the greatest importance to reducing household and environmental health hazards.

General incidence of insects and odour nuisance

Odour and insect nuisance are the second and third most commonly noted problems mentioned by users of latrines in urban areas. However, percentages in both cases are small (accounting for only 7 per cent and 4 per cent of cases for 'smell' and 'insects' respectively), with 'emptying' being the single most frequently noted problem (12 per cent).

Incidence of insect nuisance by latrine type

The figures for insect nuisance largely mirror those for odour. Again, the majority of cases are registered within the 'none' or 'tens' categories (92 per cent of all cases); bucket/pan latrines show the highest nuisance scores, while water seal latrine types show the lowest nuisance scores (see table 3 below). VIP latrines record the highest rating amongst all latrine types in the 'thousands' category. Factors leading to increased light levels within the VIP latrine superstructure (such as making small windows) may help to explain this poor rating.

The findings from the quantitative testing for numbers of insects contained within latrine superstructures tend to reinforce the results from the household survey about insect nuisance. Just over two thirds of all cases sampled (n=71) recorded 0-5 insects, a further 27 per cent cases recorded 6-50 flies, and only 7 per cent recorded 51-100+ insects.

Latrines the primary source of insect nuisance on the household plot?

Anecdotal evidence from interviews with householders about the source of insect nuisance, especially with regard to flies, indicates that the latrine structure is not necessarily the primary source of insect nuisance on the plot. Other important sources include solid waste pits and lane side drains, which when full or blocked, quickly attract flies.

Incidence of odour nuisance by latrine type

For the question '*Does the toilet smell? How bad is this smell?*' It is important to note how few of the responses fall

under the 'strong smell' category. What is unusual are the responses for both simple pits and VIP latrines; with the former registering larger percentages under 'no smell' and smaller percentages under the 'slight smell' categories than the VIP latrine type. Previous assumptions about simple pit vis-à-vis VIP latrines would tend to question such a finding especially given that VIP latrines had been designed specifically to address the problem of odour nuisance. One possible explanation may be that the odour problems in VIP latrines are exacerbated by increased fouling around the squat hole due to the dark interior of the latrine.

Key findings

- Only small percentages of households perceive odour and insect nuisance to be a common problem with their latrine (although nuisance of this kind does have a significant impact on satisfaction levels);
- Bucket/pan latrines register the highest nuisance levels of all latrine types.
- Relative to other latrine types, VIP's record higher than anticipated levels of odour and insect nuisance. There is little conclusive evidence to suggest a link between odour and insect nuisance and height of vent above roof line, presence of fly screens, vent pipe colour and diameter of pipe;
- Anecdotal evidence raises doubts about domestic latrines as the primary source of insect nuisance on-plot.

Absence of household latrines

Background

In the urban context, the factors which determine whether sanitation facilities are present or absent from the household plot are diverse, including issues such as poverty, cost of technology, available space, indebtedness and problems with operation and maintenance. Available literature emphasises the importance of the lack of space in the urban environment as a key feature explaining absence of household sanitation.

Plot size a determinant of absence of household latrine

As mentioned above, criticism of pit latrines focuses on their supposed inappropriateness for small plot sizes. Results from the household survey indicate that for the users, absence of a household latrine is more a function of poverty than available space on the plot. When answering the question, '*Why is there no household toilet?*', the single largest responses from users recorded 'high cost'; and 'use public latrines', factors directly or indirectly linked to income. 'Lack of space' figured only as the third most important response. Poverty may lead householders to prioritise the use of what space they have on plot to other functions, not consistent with sanitation.

Figures from the postal survey of sector professionals (n=57) tend to reinforce these findings, with cost being cited as the single most significant factor. Combinations of cost and lack of space are also frequently noted.

Key finding

- A key reason for the lack of household latrines is poverty, rather than lack of available space on-plot. Poverty, and/or the inability to save funds to invest in longer term sanitation facilities are key constraints;

Plot size*Background*

Critics of pit latrines often claim they are unsuitable for small plots in urban areas. In Jamaica, regulations prohibited pit latrine construction in areas where the density was higher than ten houses per acre (23 houses per hectare); in Indonesia, regulations state that areas with over 250 persons per hectare shall be classified as densely populated and shall not use on-plot excreta disposal (Alaerts and others, 1991). In a manual prepared for Habitat it was stated that the pit latrine system (except VIP's) is 'unsuitable for use in even low density urban developments' (Roberts, 1987). The smallest plot size recommended for twin pit pour flush latrines in India is 26 square metres (Riberio, 1985). None of the criteria used appear to be based on reasoned argument or on evidence of performance.

On-plot sanitation unsuitable for small plot sizes?

Significant proportions of sample households with operational sanitation facilities were found on relatively small plot sizes: one third of all such cases were measured with plot areas of up to 150m²; just over 10 per cent on plots with an area not greater than 54m². Although this indicates the coincidence of domestic sanitation on relatively small plots, it fails to say anything about the performance or suitability of the facilities. Although not an ideal measure of 'suitability', levels of user satisfaction are indicative. When asked to express degrees of (dis)satisfaction with their facility, those households with the smallest plot sizes (defined here as in the range 13-110m²) expressed high levels of satisfaction, 83 per cent being either 'satisfied' or 'very satisfied' with their facility, with 13 per cent either 'unsatisfied' or 'very unsatisfied'. Importantly, in crosstabulations between satisfaction levels and recorded problems with latrines, lack of space does not feature amongst the most commonly noted problems.

Key findings

- Levels of user satisfaction were not significantly affected by the incidence of small plot size;
- There is little indication that plot size is associated with particular operational problems. Where the most common latrine problems were noted, they were spread across all size categories.

Discussion

The assertion that on plot sanitation systems are inappropriate for low income urban areas does not match with experience from the field. Findings from this research indicate that a variety of lower cost systems are found to be performing well on small plot sizes, with limited odour/insect nuisance, without significant operational problems and to the satisfaction of the end user. However, there still exists a significant gulf between the perceptions of sector professionals and those of the community when regarding the appropriateness of on-plot sanitation in the urban context. This in turn may limit the opportunities for widening sanitation options at the local level. The findings from this work show that professionals' understanding of key issues such as insect/odour nuisance, or the operational problems associated with on-plot systems must be advised by the opinions and perceptions of those who actually use the system.

Clearly a participative exchange of opinions and experiences is required between communities and local authorities. The participation of communities in the development process has become a critical element in contemporary project design and management. In some cases, project financing is conditional on the application of participatory processes. However, it is clear that achieving effective participation, and bringing about a closer alignment of perspectives is more difficult to achieve.

The identification of differences between user and sector professional perceptions of technology choice and performance is instructive as a reminder of the need to constantly question in-built assumptions. Beyond this, there are wider and potentially more challenging questions to be asked about the most effective way in which the gulf between these perceptions can be spanned.

Notes

- 1 On-plot sanitation systems are those which are contained within the plot occupied by the dwelling. On-plot sanitation is associated with household latrines, but also includes facilities which are shared by several households living together on the same plot.

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