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25 Sanitation and hygiene in South Asia: Progress and challenges

Summary paper of the South Asian Sanitation & Hygiene Practitioners' Workshop organised by IRC, WaterAid and BRAC in Rajendrapur, Bangladesh, 29-31 January 2008

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Abstract

In January 2008, sanitation and hygiene improvement practitioners in South Asia got together in Rajendrapur, Bangladesh to discuss progress in improving sanitation and hygiene. This summary paper focuses on household sanitation. School sanitation has been purposely left out as an area deserving systematic review on its own. The paper gives an overview of what has been achieved in South Asia and what has not, or insufficiently, been addressed. It also identifies four suggested areas for regional cooperation. The overall aim is not only achieving the MDG target of halving the number of people without a sanitary toilet, but also to achieve universal use and basic hygiene, and well-sustained facilities and programmes. Fulfilling these aims requires

large-scale, cost-effective approaches and validated outcomes.

Considerable progress has been made in ten subject areas, although there is room for more: policy development, low-cost solutions, user choice, decentralisation, mapping poverty areas, funding of demand creation, motivating users, local production and supply, phasing out ineffective subsidies, and going beyond numbers to healthy practices. Ten other subject areas are still overlooked or under-developed: diversification between and within households, cost-effective promotion, targeting remaining subsidies with equity, upgrading toilets over time, environmental safety, scope for dry toilets, sanitation in urban slums, short-term versus long-term programmes, sustainability of

facilities and programmes, and organisational and human capacities - especially at the crucial intermediate level.

To move forward, participants proposed to cooperate as a Community of Practice in advocacy and in four areas of action research: assessing and enhancing cost-effective promotion and delivery, common indicators to validate successes, safer management of the sanitation chain in urban areas and action research on citizen's voices, stakeholders' responsiveness and funds accountability. Surprisingly, enlarging human and institutional capacities for effective large programmes did not emerge as a priority subject.

Introduction

In 1990, the baseline year of the WHO/UNICEF Joint Monitoring Programme on Water and Sanitation, global access to improved sanitation was 49%. Some 12 years later, at the midpoint of the MDG period in 2002, this had grown by 9% to 58%¹. So, to reach the target of 75% coverage, growth over the succeeding 13 years must reach 26%; almost treble that of the preceding half and clearly a huge challenge. In 1990, South Asia had a coverage level of 20%, the lowest of all world regions. In 2002, it had surpassed Sub-Saharan Africa as the worst-off region (36%) by just 1%. In absolute numbers, however, the largest number of people without safe sanitation still live in South Asia: 938,502,000 – more than twice the

437,224,000 people who remain unserved in Sub-Saharan Africa.

Rapid coverage in the remaining years is widely desirable, but it must also be effective. The ultimate aim is after all, not only construction, but also hygienic use by all, and that the remaining unserved *and* all households newly formed after 2015 also acquire safe sanitation. Only then will open defecation end forever and will the toilets themselves not become new health hazards. With these outcomes and targets in mind for the remaining eight years, the focus of this paper is on what has been learned so far on sanitation in South Asia and which issues are still unresolved or unrecognised. The aims are to encourage discussions, select key topics for further work and lay the basis for the establishment and directions of a Community of Practice, increase cooperation and harmonisation of verifiable approaches, and to reduce wasteful duplication and competition.

In order to do this, the report is structured as follows:

- Section 2 contains the main factors that have emerged as being integral to success in southern Asian programmes and policy in recent years: what has been learned?
- Section 3 describes the areas where further consideration is needed: what is unresolved?
- Finally, section 4 summarises the future challenges and opportunities for cooperation: where can we make the greatest difference?

Sanitation and hygiene in South Asia: areas of progress

In this section the most important parameters on which consensus has been developing in South Asia are reviewed. These can be considered as

¹ http://www.who.int/water_sanitation_health/monitoring/jmp2005annexes.pdf

ten areas of progress. Accepting that these might not be exclusive, they are listed and then covered in the text which follows:

- 1 – Political will is required
- 2 – Priority is given to onsite sanitation
- 3 – Low-cost models can increase coverage – at what cost to sustainability?
- 4 – Government has a role, at different levels, and must perform it
- 5 – Mapping conditions across poor urban areas triggers action
- 6 – Effective IEC is required for sustainable hygiene/sanitation behaviour change
- 7 – Effective motivation is based on the desires of users, not the desires of agencies
- 8 – The belief, and evidence, that direct household subsidy is unhelpful is gaining acceptance
- 9 – An active local private sector is required
- 10 – What to measure – installations or behavioural impact?

Political interest, policies and strategies

Politically, there has long been little interest in sanitation and hygiene, at least in part because they are female rather than male priorities. Few countries have a specific sanitation policy that is distinct for rural areas, towns and the urban poor. Combined policies are dominated by domestic water supply. Government expenditure on sanitation has also been low, although amounts may be less important than ways of spending (see sections below on *Funding IEC to create demand; Motivating factors of users, not agencies; and Phasing out of direct subsidies*).

In Bangladesh, work on water supply started in 1935. Safe sanitation came 19 years later. Government outlays dropped from the first to the fourth FYP and only sharply increased during the fifth, but mostly for arsenic mitigation in water supply. Overall, government expenditure remained on a flat line (Kabir, undated). Bangladesh needs three times the current outlay of Tk 8.3 billion per year on sanitation to meet its national target². In India, central budget allocations to the water sector started in 1951. A national rural water supply programme began in 1972. A rural sanitation programme came 13 years later. India's outlay for the sector grew from 1.8% to 4% in the first to the eighth FYP, but the funds went mostly to water. In the eighth plan, the budget for water supply was 96%, for sanitation 4% (Kolsky et al, 1999, HoC, 2000). In Nepal, 70% of the national budget for the sector in 2000-2015 will go to one water supply scheme (Melamchi). The estimated shortfall for sanitation is US \$6 million per year (WaterAid, 2004). Between 2002 and 2005, Pakistan's annual budget for water and sanitation was 0.1% of GDP and again it was mostly for water (GoP, 2006). Sri Lanka had the highest sanitation coverage in the region in 1990: 69%. It has reportedly grown to 91% in 2004. However, the tsunami on 26 December 2004 destroyed an estimated 60,000 household toilets. The estimated costs of emergency sanitation and rebuilding toilets are US \$4.4 million³, and fund allocation is threatened by the growth in military expenditures, doubling from US \$69 billion in 2006 to US \$139 billion in 2007.

The region's reluctance in taking up improved sanitation is not uncommon. The working group

² http://www.financialexpress-bd.com/index3.asp?cnd=6/13_2007§ion_id=1&newsid=64035&spcl=no

³ <http://www.irc.nl/page/16188>

TABLE 1 Barriers to progress in sanitation

1. Lack of political will
2. Low prestige and recognition
3. Poor policy at all levels
4. Poor institutional framework
5. Inadequate and poorly used resources
6. Inappropriate approaches
7. Failure to admit disadvantages of conventional sewerage
8. Neglect of consumer preferences
9. Ineffective promotion and low public awareness
10. Women and children's needs are considered last
11. Little effective demand
12. Cultural taboos and beliefs

Source: Simpson-Hébert and Wood, 1997

on sanitation of the Water Supply and Sanitation Collaborative Council (WSSCC) identified as many as 12 reasons (Table 1). The list mirrors the experience of countries in the north (Box 1).

This situation is gradually improving. It has become more widely known that improved sanitation and hygiene have a greater health impact than a safe water supply (Cairncross and Valdmanis, 2006) and governments are becoming more sensitive to the need for better sanitation for reasons of human dignity, environmental cleanliness and poverty alleviation.

Both Bangladesh and India formulated new national sanitation strategies and campaigns with earmarked funding (Box 2 and 3), although both do not pay specific attention to the urban poor.

Nepal approved a national sanitation policy in 1994 and formulated national guidelines in 2005. It is, however, not explicit on onsite toilets, which is the most common form of improved sanitation,

BOX 1 Low priority for improved sanitation in the Netherlands

The low status and priority of improved sanitation is not restricted to the developing world. It took till the mid-1900s before each municipality and council in the Netherlands had accepted their responsibilities for public health and the quality of the environment. While domestic water supply was accepted as a public responsibility starting with the village pump, the disposal of human excreta, solid waste and waste water were considered private responsibilities only and the subject of public bans, not services and programmes. In 1481, the city of Amsterdam introduced its first law on waste disposal, but this only forbade the citizens to throw domestic waste into the canals. A law of 1497 stated that “every young woman, or who else is in charge, will clean the street in front of the house each Saturday and on the evenings before holy days” (Sijbesma, 1994: 6). For the municipalities human waste was especially a source of profit. At the end of the 19th century, the income from human excreta in the city of Groningen was 50,000 guilders per year (Noort, 1990), 1.3 million Euro today. Bucket toilets were in use in poor urban areas until after World War II.

Political willingness to address poor sanitation began to increase when the public, which resented the bad smell and dirty environment, joined hands with the public health inspectors which the central government appointed from 1865 onwards. The inspectors' aim was to reduce the incidence of infectious diseases related to poor sanitation and hygiene, such as dysentery, diarrhoea, cholera and typhoid. The time of action coincided also with wider societal changes, especially an improved level of education, the emergence of voluntary organisations for the development of the lower classes such as public libraries and credit and loan societies, improved communications and the rise of the women's movement (Verdoorn, 1965). Change nevertheless took a long time in some areas. In the city of Delft it took until 1975 before everyone had replaced their bucket latrine with a sanitary toilet.

BOX 2 Bangladesh 'Sanitation for all by 2010'

The Bangladesh national sanitation campaign 'Sanitation for all by 2010' builds on Community Led Total Sanitation (see Box 4), but has its own characteristics:

- A baseline study in 2003 showed the national coverage of sanitary latrines to be 33%
- Growth started at 1% in 1971 to about 37% in 1998, but stagnated around 40% and then dropped
- The lowest level of local government, the Upazillas (sub-districts) implements the programme. Bangladesh has six divisions, 64 districts, 472 Upazillas and 4,451 Unions. A union has about 25 villages and c. 13,000 households. One village may consist of 5-15 sub villages, each with c. 50-60 households
- 20% of the Upazilla Annual Development Programme (ADP) Grant is earmarked for sanitation
- 25% of the funds can be spent on motivation and mobilisation and 75% on hardware
- At national level, TV spots, cinema films and October as Sanitation Month are used to motivate latrine installation
- A standard toilet (concrete slab, concrete or plastic pan, three rings) costs some Tk 380 (US \$6)
- Private entrepreneurs and PHED supported Village Sanitation Centres, the latter mostly at Upazilla and union level, sell parts/full toilets
- Upazilla Parishad members can give free toilets to the hardcore poor (land and homeless – where can they put toilets? – daily labourers, disabled and non-earning heads of households). Estimates are that one in three without a toilet qualify, or one in five of the total population. The total sanctioned budget for free toilets is Tk 50 crores (500 million) or US \$7.3 million
- Chairmen of totally open defecation free unions get a reward for their area; outstanding chairmen got overseas study tours as personal reward
- Coordination is by the sanitation secretariat in the Department of Public Health Engineering, a National Task Force headed by the secretary, local government division and sanitation committees at Upazilla, union and ward levels.

Sources: Government of Bangladesh, 2005; Kar and Bongarts, 2006; Jong, 2005; Rahman and Gosh, 2006

BOX 3 India: Total Sanitation Campaign (TSC)

Key characteristics of India's Total Sanitation Campaign (for the rural population only) are:

- Offering a broader range of technologies and technology improvisations with reference to customer preferences, construction materials and capacities
- Developing back-up services such as sanitation production centres (PC) and rural sanitary marts (RSM) with trained masons
- Stressing software, including intensive Information, Education and Communication (IEC) campaigns
- Dovetailing funds from GOI and state programmes aimed for rural development
- Fostering broader participation including NGOs, civil society organisations and CBOs
- Target group: especially Below Poverty Line (BPL) households
- Districts can submit plans with 5% preparation, (100% central finance), 15% IEC, 5% alternative delivery mechanisms, and 5% overhead costs (all with 80% central, 20% state finance), 60% hardware costs household toilets (60% central/20% state/20% user), 10% school systems (60%/30%/10%)
- Subsidy and subsidy sharing is GOI/State/Household 60/20/20% for underground parts @ Rs 625 (US \$13 in 2001, users to pay all upper parts) and 30/30/40% for underground parts @ Rs 1,000 (US \$21). Subsidy is to be gradually and progressively phased out
- Open Defecation Free communities, blocks and districts can go for prize money
- Pilots in 115+ districts had increased to 200 districts by the end 2002 (one district = circa two million people). India has 593 districts, of which 578 are rural

Sources: GOI, 2001, Shordt, 2006

except that subsidies are to be phased out. Institutionally two national agencies are still both responsible for sanitation⁴.

Sri Lanka formulated a new policy in 2001, but it addresses both rural water supply and sanitation. Both are made demand-responsive, that is, people and communities install the technologies and service levels that they want and can install and sustain. Users can form Community Based Organisations (CBOs) to plan, implement, finance and manage schemes and so can *Pradesiya Sahas* or village councils, the lowest government level. Targets for total coverage have been set for 2025.⁵

Pakistan published a national sanitation policy in 2006. Communities, housing societies and investors from the private sector are to build and finance toilets, lane sewers and collection sewers in settlements with over 1,000 people and local governments the trunk sewers. In smaller communities, promoters from different agencies, e.g. Ministry of Health, NGOs or Local Government are to promote households to build their own sanitary toilets. Successful agencies are then to become the capacity builders for other actors, such as government officials, elected representatives, community activists and *Tehsil* (sub-district) Management Administration staff who should replicate the approach in other areas (GoP, 2006).

Priority to onsite sanitation

Quite an achievement in South Asia is the high acceptability of onsite solutions in rural and urban areas. Virtually from the start, individual household pour flush toilets – direct one pit or off-set two pits – were the promoted options in Bangladesh, India, Nepal and Sri Lanka. In the same period Pakistan experimented successfully with low-cost community-built and financed primary sewerage as the recommended solution for all communities with more than 1,000 people. Examples of successful shallow sewerage projects in this book come from Karachi (Welle and Wicken, Chapter 8), Faisalabad (Haider, Chapter 3) and Quetta (Qutub et al, Chapter 4). The latter case also presents the sustainability and impacts of the service four years after completion. Technically the service is working well and impacts are excellent, but there is some local lack of upkeep and the institutions in which users organised themselves for action have not continued to function.

In spite of this innovative outlook, the initial onsite models were still too expensive to be affordable for the poor. In Bangladesh, the subsidy helped to create initial demand, but the promoted toilet model was still too expensive for 80% of the population. Installation began to increase when the local private sector noted the demand and came with cheaper parts and lower transport costs.

⁴ Focal point is the National Sanitation Cell in the Department of Water Supply and Sanitation (DWSS). This falls under the Ministry of Physical Planning and Works (MPPW). The cell is assisted by a National Steering Committee for Sanitation Action. Implementation is under the Ministry of Local Government (MLD), however. This ministry has (often inactive) District Water and Sanitation Committees attached to the District Development Committees, and Village Water and Sanitation Committees under the Village Development Committees (VDCs). The latter are the lowest level implementers. Technical assistance comes from the District Technical Office under MLD (Tayler and Scott, 2005).

⁵ <http://www.cosi.org.lk/page/418>

In India, the government and UN agencies jointly adopted the double vault pour flush model (originally an urban model) as the country-wide standard for rural toilets, an imposed choice although without attention to the urban poor that

was too costly for most. Other shortcomings besides the still-too-high cost were the emphasis on technology, the lack of effective promotion, programme implementation by state engineering agencies without organisational interest, career

BOX 4 Community Led Total Sanitation (CLTS) approaches

The CLTS approach was started by VERC and WaterAid in rural Bangladesh. CLTS focuses not on toilets, but on the shameful and unacceptability of open defecation and stresses community responsibility and social pressure to end this practice. To this end, external facilitators first organise a transect walk to all open defecation sites. In a public session people then calculate the load of human excreta thus deposited over increasing periods of time. The actions usually lead to a rejection of open defecation and a commitment to become Open Defecation Free (ODF). Facilitators and local volunteers then encourage households to build and use the kind of toilets they want and can pay for, no matter how simple or temporary. Social pressure helps everyone to conform.

The approach became popular in a short time because of quick results. However, a number of reservations have also emerged: (1) there are no agreed minimal procedures with quality criteria to avoid shortcuts that threaten proper design and implementation of CLTS; (2) participation is sometimes coerced, e.g. officials or leaders impose high fines on non-participants; (3) local support to those with financial or physical problem (e.g. the elderly, the disabled, single mothers) is not a systematic part of the approach; (4) results of *any* large programme, including CLTS need independent validation. Verification in two Indian districts with 9,746 Indian Gram Panchayats applying for a national ODF award found that only 46% were actually eligible. For Bangladesh, Rahman and Gosh report a national coverage increase (so not only from CLTS) from 44% to 79%, ranging from an extra 11% in cities to an extra 29% in rural areas in less than two years, but reports

from BRAC (Chapter 12, this book) and NGOF (Juel, 2007) and as yet unpublished UNICEF data state that coverage with use is much lower; (5) especially lowest cost toilets may have a low durability as noted e.g. by Pretus and Jones (Chapter 18 of this book) and be hard to keep clean, which has also gender implications – although Shayamal et al in Chapter 20 of this book indicate that poor people improve toilets over time, there is no fully representative research on this subject so far; (6) low-cost is relative: the average promotion cost reported by VERC was UK £8 per household⁶ (US \$16), equal to e.g. BRAC's toilet subsidy for the poor. The difference is that the amount that formerly went to toilet subsidies now goes to creating demand and achieving toilet construction and use by the whole village; (7) health benefits depend also on toilet hygiene and other good habits such as effective hand washing, safe drawing and storage of drinking water and safe disposal of excreta of babies and infants. The original CLTS approach covered also other hygiene behaviours and is quite intensive and long term: each neighbourhood may get a total of 200+ facilitator visits (see section on *Institutional and human capacity*); (8) long-term monitoring can show to what extent families sustain toilets and ODF practices and communities sustain management of good sanitation and hygiene. New programmes have cut many corners for quick, but incomplete and short-term results – agreed minimum CLTS standards are needed.

Sources: Galway, 2000; Halim et al, 2002; Jain, 2007; Kar, 2003; Kar and Pasteur, 2005; Kar and Bongarts, 2006; Huda, this book, Chapter 11; Khisro et al, this book, Chapter 15)

⁶ Allan (2003) gives £5 per household as the average cost for achieving an EDF Union

opportunities and specific capabilities for sanitation and supply-driven construction goals, and environmental risks (see also the Section on *Validating claimed successes*). As a result, many toilets were unused or used for other purposes (see also the Section on *Phasing out direct household subsidy*).

Acceptance of low-cost models

Successful pioneers showed that households installed low-cost toilets without subsidy when they could choose a model that they want and can afford. From 1990, Ramakrishna Mission Lokasiksha Parishad (RKMLP) in Midinapure, West Bengal, offered a choice of 12 models costing one-tenth to one-sixth of the standard twin-pit pour flush model with brick superstructure (Kolsky et al, 1999). As part of CLTS (Box 4), VERC documented over 31 designs, many developed by villagers, with unit costs starting at US \$1.27 (the famous Tk 15 model, see Allan, 2003, Kar and Bongars, 2006 and Huda, 2008 - this book, Chapter 11).

The community-managed rural and peri-urban sanitation programme in Kerala offered no choices, but local committee members helped find local materials and negotiated the best price-quality ratio from the local private sector. This lowest local cost design then became the local construction standard. Unit costs were two-thirds that of the government programme and half that of the World Bank. If households could not afford a full model, they used temporary materials for the outhouse or made the second pit only when the first one was full (Kurup et al, 1996 and Box 5).

Within programmes, only WaterAid India and VERC seem to use standard criteria to judge if toilets

are sanitary, such as minimum depth, protection against flies, absence of bad smell (VERC only) and absence of visible excreta. There seem to be no generally adopted standards against which to judge the quality and degree of durability of the installed models, one of the points for validation of claimed successes advocated in Section on *Validating claimed successes*.

Shift to decentralised planning and implementation

One major constraint to improved sanitation is that for a long time it has been seen as a private household issue only. Supporting improved sanitation is now accepted as part of the responsibilities and authority of local governments, especially in rural areas. Local governments in Bangladesh and India also get devolution of funds under the national programme. Going beyond roles, responsibilities and financial resources to processes and development of support capacities is much rarer. As far as could be found there are no documented procedures for local organisation, participation, promotion and management of large-scale sanitation programmes apart from those documented in NGO-based programmes of CLTS (Halim et al, 2002; Kar, 2003) and Panchayat-managed sanitation in Kerala (Box 5).

Moreover, although NGOs are increasingly recognised as support organisations to local governments, the same engineering departments such as the Department of Public Health Engineering in Bangladesh, the Public Health Engineering Departments in India and the Department of Local Infrastructure in Nepal, have remained line agencies for decentralised sanitation programmes. Within the engineering departments,

BOX 5 Panchayat-managed sanitation in Kerala

In 1991, 5.5 million households in Kerala had no sanitary latrine. Of them, 85% were poor. The state sanitation programme was not popular and could not close the gap. With bilateral support from Denmark and the Netherlands, the NGO Socio-Economic Units Foundation (SEU-F) tested three new strategies: NGO implemented, Panchayat implemented and local institutions. An independent evaluation showed that Panchayat management had the best match of cost and results. Central were participatory planning and management with gender balance, training of women latrine masons and monitoring for coverage and use. Latrine construction was only step nine to 11 in a 13-step cycle. A seven-member ward committee (a ward has about 500 people) with at least three women mapped local conditions, promoted toilets, chose families needing subsidy with public accounting for choice, collected and accounted for household payments, organised hygiene education (three compulsory sessions) and consolidated the construction list with the Panchayat council. The councils contributed financially and provided a technical supervisor. They helped committee members assess local private sector material and prices, make bulk acquisitions, contract masons and check construction. Special measures helped enhance transparency and prevent corruption. Between 1992 and 1997, external latrine subsidies fell from 80% to 15%. Subsidies for the poor were increasingly financed from a mix of Panchayat funds and voluntary contributions from local charities and neighbours. Contracts with the Panchayats defined the unit cost from a locally built test-toilet, Panchayat and household financing, the parties' responsibilities, the donor share, the fund flow, payment arrangements and accountability. Project duration was open-ended until all had a latrine. Costs were 33-50% lower than in other programmes and included 6-9% overheads for administrative and social support, against 20% overheads elsewhere. After construction, ward committee members visited each toilet three times at increasing time intervals to check cleanliness, operation and use by all. Internal research showed an average of 96% proper use, but excreta disposal of children under five and hand washing could still be improved.

Overall results were encouraging. In five years, 1.4 million people gained access to a sanitary latrine. Training and groupwork of over 1,200 women masons built the women's self-

confidence and skills, doubled their income and enhanced their status and self-respect. The training centre became the autonomous Jeevapoorna Women Mason's Society and expanded training to five districts. When people in the neighbouring Panchayats saw the progress and quality of the toilets, they put pressure on their local governments to change from state-managed to Panchayat-managed interventions. In 1997, five of the 14 District Panchayats launched their own programme for total sanitation. In 1998, this became the state wide programme of 'Clean Kerala' reaching out to all 990 Panchayats.

In the same year of 1998, the People's Planning Campaign took place, in which women and men in all Panchayats formulated their development priorities. Special training for women increased their participation and helped identify 1,793 sanitation projects with a total estimated cost of Rs 303 million (US \$450,000). To meet the priorities, the state government devolved 35-40% of its annual plan funds to the Panchayats between 1997 and 2000. A sanitation taskforce formulated a new sanitation strategy. It reduced the state subsidy, allowed households to choose their own models and authorised local governments, ward committees and neighbourhood committees to plan, implement and manage projects. SEUF was a taskforce member and provided training.

During the first three years, Panchayats and households built 413,000 latrines, over three times the 125,000 latrines built during the eighth FYP. The underlying people's plan is under threat, however. A different party in power lowered plan funds to Panchayats by 16.4% and granted Rs 25,000 to each MP to spend as s/he liked in his/her constituency. It increased the influence of government officials on the taskforce and abolished the positions of block and district coordinator, held predominantly by representatives from civic society. Regulations which ensured women's representation were disbanded, except for so-called "women's projects". Women's self-help groups could no longer receive plan funds if they had members who worked ten days per month or more as agricultural labourers. The new rule put an abrupt end to many existing groups and to the formation of new ones. The effect of these new policy diversions and hindrances on the state sanitation programme is yet to be evaluated.

Source: Kurup et al, 1996; Shordt, 2006b; Sijbesma, 2006

engineering staff and managers (who are engineers as well) have little incentive to become low-cost sanitation specialists and replace some engineering staff by social experts in sanitation to support rural Panchayats and the urban poor. Nor are there indications that the education and career criteria of engineers have changed to reflect progress made in community planning and management of sanitation programmes. While bureaucrats want Gran Panchayats to take up sanitation under new decentralised and demand-responsive sanitation policies, Panchayats lack interests and capacities for effective sanitation programmes (Kumar and Kumar, Chapter 16 in this book).

Mapping of conditions of the urban poor

Environmental conditions in the living areas of the urban poor are appalling. The illegal nature of many of these settlements has given the municipalities an excuse for actions ranging from turning a blind eye to expulsing the people and flattening their houses. There are now initiatives by NGOs in India, Nepal and Pakistan to identify all legal, semi-legal and illegal settlements in metropolitan areas and map the conditions of water supply, drainage, excreta, waste water and solid waste management, and road paving (and sometimes lighting). In Nepal, the Centre for Integrated Urban Development (CIUD) prepares urban profiles and poverty maps using a combination of GIS and other IT based techniques and social surveys. GIS also helped achieve credibility for community sewerage plans in Faisalabad, the fourth city in Pakistan (Haider, Chapter 3 in his book). In four cities in Madhya Pradesh, WaterAid India and partner NGOs have mapped all 'poverty pockets'. In Karachi, local male youths trained by OPP in basic mapping techniques

(including computerisation) have by now mapped the excreta, waste water disposal and drainage conditions in 60% of all informal settlements, an example followed by other NGOs in at least cities and two of the four provinces (Welle and Wicken, 2008, Chapter 8).

The unit cost of such mapping techniques is not yet widely reported. In Nepal, CIUD invested Rs 50-60 per household (US \$0.7-0.84). The resulting hard and valid information shows up the real scope of the problem. It has been a means to exert pressure on the authorities, initiate community actions and bring about partnerships between communities, NGOs and municipal governments for accountable and measurable improvement of environmental sanitation. The mapping also provided a means to prioritise the worst areas for action in a transparent manner (Dabrasc et al 2007; UN-HABITAT and CIUD, 2005; UN-HABITAT et al, undated; Qutub et al, 2008, Chapter 4 in this book).

Funding IEC to create demand

A major challenge for meeting sanitation goals is that toilet demands are often low or hidden. Demands are low in areas where people still have open space, vegetation provides privacy or other demands have a higher priority. Rural and urban women often have a higher need and demand, but lack opportunities to express them and influence to see them met. Hence, stimulating household motivation in a gender-specific way to want, build and use toilets is usually needed.

To raise awareness and motivate demand, toilet programmes have increasingly added an Information, Education and Communication (IEC)

component. In Bangladesh, social mobilisation with IEC was piloted in the rural water and sanitation programme in 1986 and expanded country-wide in 1995. The quality of the approaches varied a lot, raising questions about “avoiding [...] coercing in latrine building, [...] ensuring the sustainability of achievements, and involving health workers, imams and other local leaders in promoting sanitation” (Boot, 1995:9). Information on costs of promotion, absolute and as a proportion of hardware or overall costs is not included. Most activities “just consist of telling people what to do, with or without the help of flipchart or other visual material” [p.28]. Except for the Sanitation and Family Education (SAFE) project and the Intensive Sanitation and Hygiene Promotion Programme, results were not measured (Boot, 1995).

In 2000, the Bangladesh rural social mobilisation programme was evaluated. The report only gives information on results; it is silent on the cost of social mobilisation and its proportion of the total costs. All respondents were subject to some motivation, the men mostly through mass media messages, and the women through home visits by health and family planning workers. Impacts were related to income: toilet ownership (49% on average) became 100% only for households earning Tk 5,000+/month. Without baseline and with a long intervention (since 1988) it is not possible to say what difference social mobilisation has made, but about half of the owners had built a toilet only in the last phase (1997-99). Overall, over two-thirds had built their toilet without subsidy. Reported toilet use was, however, only 28% and excreta of infants were put in the latrine in less than half of the families. Training to raise toilet demand by a special Hygiene Awareness

and Product Information Campaign (HAPIC) was very conventional, using health benefits for motivation and little or no attention to technical and financial issues, durability, use and child defecation (House of Consultants, 2000).

Outdated one-way spreading of general messages began to disappear in Bangladesh when the SAFER project showed that a mix of different and flexible methods with different groups (including also children and all-male groups at tea stalls and markets) was more effective. PRA methods such as those used in CLTS (see e.g. Huda, this book, Chapter 11 and Saha et al, this book chapter 6) and promotion through schools (Khan et al, Chapter 14 and Adhikari and Shrestha, Chapter 9) also proved very effective for sanitation and hygiene promotion in communities. Recent programmes increasingly use participatory methods (e.g. PRA, PHAST) and to some extent share training. However, most do not want to use materials and methods that do not carry their own stamp and acronym, even when this means investing considerable funds to make only minor changes (Ahmed, this book, Chapter 22).

In India, UNICEF implemented a social mobilisation strategy in its (mainly rural) programme with the Indian Government since 1985. The budget for sector support increased steadily from less than US \$2 million in 1975 to US \$10 million in 1995, and the shares for sanitation and IEC grew from respectively 1% and 8% in 1985 to 9% and 22% in 1995. The methodology combines mass information for awareness raising with home visits by paid promoters for conviction and use. An international evaluation found that promotion of health and hygiene is now seen as the most important subject area, but that much work is remaining to build

capacities and develop effective programmes. Home visiting is very labour intensive, and promotion of good practices is done from the health perspective of the agencies with little attention to what really motivates the different types of users and little adjustment of methods and messages to the different interests and information channels of the respective target groups (Kolsky et al, 1999). An indicative evaluation (Baldwin et al, 2004) showed that in the majority of villages information reached poor women and men. However, the benchmark on information access was met or surpassed in only one third of

the visited communities: group scores of women and men clustered in the lowest two categories (Figure 1). Figure 2 below shows that attitudes and behaviour of the promoters varied a lot: while in up to half of the communities they seldom visited the poor and at best gave one-way information, the other half was much more pro-poor, communicative and gender conscious. As a result, poor people in over half of the villages knew nothing of various latrine options. Information on the range of options and their costs and financing had reached poor men *and* women in only 20% of the villages. It is likely that better or worse quality

FIGURE 1 Access to WASH information, Child Environment programme, in 117 Indian villages

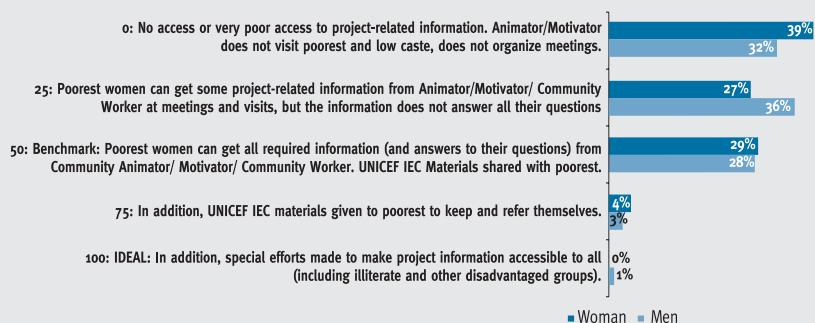
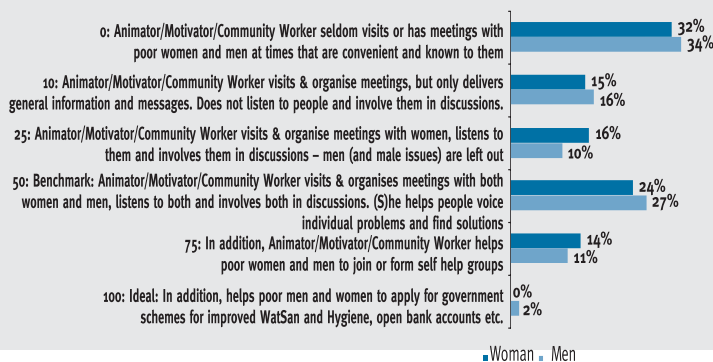


FIGURE 2 Attitudes of promoters to gender equality and equality of the poor, in 117 Indian villages



IEC is significantly related to better or worse results, but this could not be established here, because of lack of representation of the too small sample.

Since 2001, Indian national (rural) programme guidelines include an allocation of 15% of state programme costs to IEC, with shared financing between central and state governments of 80% and 20% (Gol, 2001). However, as shown above, and by Kumar and Kumar (Chapter 16 in this book), more funds for IEC do not automatically lead to good results. This depends also on the quality of implementation, including the training and human resource management of the promoters. There is a clear need of evidence-based guidance for good quality programmes which can come from cost-effectiveness (action) studies, as discussed in the Section on *Assessing and enhancing cost-effective promotion and delivery* below.

Motivating factors of users, not agencies

While programme agencies have promoted toilets on their (long-term) health benefits, users generally have other, more immediate reasons for installing and using toilets. More convenience, dignity, privacy and status are now recognised as having a greater relevance for users than health. In the CLTS approach, a combination of disgust over the dirt and stench of open defecation areas, and the frequent ingestion of particles of human excreta via the six F's (faeces, fingers, flies, fluid (water), food and fields), the incredibly high loads of human faeces gathering at people's living environments and water sources and the indignity of having to excrete in public have proven to be effective stimuli for improving sanitation from the 'bottom up' (Huda, Chapter 11 in this book, ; Khisro et al, this book, Chapter 15).

Research in Africa has shown even more varied patterns of why people build toilets. In Dosso, in rural Niger, owners gave 36 reasons for installation; health was only one and scored very low on the priority list (Sijbesma and Koutou, 1995). A study in rural Benin found three groups of reasons, with decreasing importance: (1) prestige (2) well-being, covering health, but also safety from accidents, various types of animals, robbers and sorcery, as well as convenience and comfort, cleanliness and privacy and (3) special situational factors, such as physical restrictions due to old age or illness, charging higher housing rents and religious requirements (Jenkins and Curtis, 2005). Allan (2003) has similar findings from four Bangladesh villages, although the classification differs somewhat. She also found that health benefits were the least frequently cited.

In these studies, economic benefits are not recognised as a category by itself, but such benefits do play a role. In rural and peri-urban areas in Kerala, male owners mentioned the increased value of their house (Kurup et al, 1996). For women, long distances to sanitation sites may mean less time for income-generating and cost-reducing work. In Bangladesh, cost savings from reduced disease helped finance further upgrading of toilets (Huda, this book, Chapter 11). In densely settled Java, the decrease of public land and the wish to avoid conflicts with private landowners also increased walking distances and productive time losses from open defecation by men. Various types of double vault toilets have further benefits of the economic value of human waste and avoidance of pit emptying costs.

The situation is still more complex, because reasons for demand are not the same for every user

category. Slowly, different sub-sets are emerging with reasons, as well as barriers, which vary by sex, age, class, occupation and type of settlement (Allan, 2003; Jenkins and Curtis, 2005). Asian men, for example, value privacy for their womenfolk rather than for themselves, reflecting higher privacy demands and greater safety risks for women and girls than for men. This may also explain why toilet *use* is greater for women and adolescent girls than for children and men (Gol, 2003). Reasons for using potties for children and safe disposal of their excreta are hardly researched.

Reasons *not* to construct and use toilets also vary, showing several weaknesses in promotion (Baldwin et al, 2004): (1) economic: not able to pay; assuming high costs and not aware of lower-cost models, possibilities of staged construction and smaller designs in case of limited space; need to pay basic investment in lump sum; more water needed, with more collection work and time; a fear of rapid filling up of pits reducing the economic life of the investment (“I eat one kilogram of rice twice a day, there are five members in my family – this small pit will be full in three months’ time”, pp 9) and losing one’s BPL status if one has a toilet; (2) convenience and comfort: women’s fear of being seen (e.g. through windows or under doors); confined space restricts defecation; loss of mobility and socialisation from visits to defecation areas; no more open air; sharing between relatives of either sex (3) health: no awareness of health risks from open defecation, fear of safety for children, and (4) negative reputation of toilets from poor design or construction, such as bad smell, flooding and slab collapse.

Other emerging demand factors (undistinguished for rural and urban poverty areas) are that *men* value especially status (of owning a toilet, but not

necessarily also using it), that *women* go more for convenience and comfort (which means not only having, but also using a toilet), that *younger* and *more educated* people value toilets as part of a modern lifestyle and better family health, people with a *higher level occupation* or *tied to the house*, e.g. shopkeepers have a greater toilet demand than *farmers* who can use their land for defecation; and demand is also higher among families in *dense settlements* and areas with *less vegetation*, and that both the powerless and the powerful are influenced by *peer pressure* (Baldwin et al 2004; Jenkins and Cairncross, 2002; House of Consultants, 2000; Jenkins and Curtis, 2005; Kurup et al, 1996). The above studies show that ‘one set serves all’ does not work and that a high degree of fine-tuning of messages, senders, channels and tools for different groups in different settings is needed, as well as a good system for feedback from each of these groups.

Phasing out direct household subsidy

The national rural sanitation programmes of Bangladesh and India both opted for promoting only one standard toilet model. When many households did not want to install this toilet because they could not afford it or deemed it too costly, the programmes introduced a subsidy. In India this was 80% and originally went to everyone, irrespective of their socio-economic status. Later, the subsidy was restricted to Below Poverty Line (BPL) households only. Recent new models such as dry latrines are also installed with subsidies of 60% (greater Kathmandu, Nepal) to almost 80% (Tamil Nadu, India) to make them more attractive and affordable. Toilets with community-managed sewers were installed with subsidy in Quetta due to the common practice of subsidisation and

pressure by politicians (Qutub et al, Chapter 4), whereas in Faisalabad no subsidy was given (Haider, Chapter 3).

There is growing evidence that blanket subsidies to large groups of people are not the most effective solution to ensure total sanitation (Kar, 2003, Smet, 2007, Swann et al 2007; Haider, this book, Chapter 3; Shayamal et al, this book, Chapter 20, and section on *Shift to decentralised planning and implementation* above):

- Many toilets are installed without subsidy if none is available
- Subsidy keeps prices artificially high
- Over-designed models are kept intact. Toilets installed by Jal Nigam and PSP in Uttar Pradesh, India, for example, were over dimensioned and had metal doors, plastered and whitewashed inside and out and scroll-work windows, and were a lot better than the huts poor families lived in
- Subsidies benefit the less/least deserving as they learn about their availability first and know the ropes to get allocations. Few programmes had transparent selection criteria, used participatory methods to select the most eligible households and publicly accounted for the selection
- The amounts available for subsidy are seldom enough to serve all eligible households
- Those not served wait for new subsidies
- Subsidies are kept going by politicians and bureaucrats who benefit because they give them votes and allows them to control, and sometimes manipulate, large funds
- Communities continue to live in a stage of technocratic and financial patronage.

In Nepal, Pretus and Jones (Chapter 18 in this book) found that the community-level programme investment costs for full coverage in a typical village ranged from NRS 17,000 (US\$ 243) for the high subsidy programmes to NRS 340,000 (US\$ 4,857) in a promotion-only programme. These costs were however exclusive of above-village investment costs for e.g. training and supply chain development.

The provision of household subsidy does not ensure that toilets are used once built, or used as intended (or that all household members are consistent users). The governments of the Indian states of Andhra Pradesh, Maharashtra and Himachal Pradesh achieved a reported construction of respectively 2.95 million, 1.6 million and 0.3 million household toilets through subsidy driven latrine programmes. However, random evaluations revealed non-use or use for other purposes such as storage of 50%, 47% and 70% respectively (Ganju et al, 2007). Reported non-use of toilets built under the national Indian programme was 50% (Gol, 2003). In Maharashtra, a total sanitation campaign replaced the initial state programme with household subsidies after a visit to the CLTS programme in Bangladesh (on CLTS, see e.g. Huda, Chapter 11, Khisro et al, Chapter 15 and Saha et al, Chapter 6, all in this book). Instead of individual subsidies, ODF (Open Defecation Free) villages can sometimes get a financial state award which they can use for development purposes (Adhikari and Shrestha – this book, Chapter 9; Ganguly – this book Chapter 10; Kar and Pasteur, 2005).

Nor does abolition of household subsidies mean that sanitation programmes become cheaper. More

investments are, however, possible to train workers on creating demand, helping to establish local supply lines and to assist communities and groups to plan and carry out their own sanitation programme. This includes providing *internal community support* to the least able families in the form of land, materials and/or labour. Successful community-managed sanitation programmes have accounts of how approaching sanitation as a community issue has stimulated solidarity between the ‘haves’ and the ‘have nots’ in communities (see e.g. Huda, Chapter 11, Khisro et al, Chapter 15, Kumar and Kumar, Chapter 16, and Pretus and Jones, Chapter 18, all in this book), but there is no systematic evidence on its spread and results; most information is anecdotal and this would clearly be an area to investigate as part of success validation and cost-effectiveness assessments.

The wide evidence that even the poorest families build toilets with their own means, given the right stimuli, models and access to local resources and credit facilities, is supported in this book (see Adhikari and Shrestha, Chapter 9, Haider, Chapter 3, Huda, Chapter 11; Khan et al Chapter 14, Khisro et al, Chapter 15, Pretus and Jones, Chapter 18 and Shayamal et al, Chapter 20, all in this book). Nevertheless, the debate on the need for some external subsidy for the extreme poor continues. An important reason given is that without some external support, the poorest people build the least durable models and are then the group that must most frequently rebuild toilets after collapse from monsoon rains or disasters (Pretus and Jones, Chapter 18 in this book). The hardcore poor were also the category that was slowest in moving up the sanitation ladder to more durable and easy to

clean models (Saha et al, this book, Chapter 6). Moreover, previous government programmes such as in India have sometimes created the conviction that a sanitary latrine must have a ceramic pan, P-trap and soil pipe as a minimum standard. A further problem is not so much the subsidy itself, but the large amounts of subsidy given by other programmes, which has spoiled the market (Kalimuthu, Chapter 13, Pretus and Jones, Chapter 18 and Qutub et al, Chapter 4, all in this book). Furthermore, the extremely poor tend to be excluded from sanitation programmes because the greater stress on cost recovery makes NGOs go for ‘creaming off’ the less poor communities. For poor people it is harder to continue investments as their income varies with the availability of work and they are more often already indebted. Finally, gaining inner community solidarity is harder when the differences between poor, poorest and ultra poor are relatively small.

NGOs such as WaterAid, Plan International, NEWAH and BRAC, and the Indian and Bangladesh national programmes therefore preserve a limited subsidy for the worst off, the so-called hardcore poor, (Ahmed, 2006; Kabir et al, Chapter 12; Kalimuthu, Chapter 13, and Pretus and Jones, Chapter 18, all in this book). BRAC research found further that the Government’s budgeting for a standard percentage of hardcore poor in each district did not reflect the ground reality of large inter- and inner district differences in hardcore poverty. Lack of valid data and inflexible budgets subsequently led to considerable inequalities in government support for the poorest, inequalities that BRAC evens out from its programme funds (Kabir, pers.com). From these observations it may be concluded that

depending on local conditions, the target groups, sources of funding, size, transparency and accountability are more essential than the subsidy as such.

Local production and supply to meet demand

An important part of the sanitation strategy in the region has been the development of the private sector. Small enterprises produce and/or distribute parts such as slabs, pans, etc, and also install full toilets. In Pakistan, the absence of local supply is a limiting factor for community-managed rural sanitation (Khisro et al, this book, Chapter 15). In Bangladesh, UNICEF and the Department of Public Health Engineering (DPHE) established some 900 production centres and 3,000 'sanitary marts' (yards and shops). They sell all materials for toilet self-construction at subsidised prices, although the actual numbers fluctuate with demand. NGOs also sponsor some 625-900 production centres. Centres were mainly found at Thana headquarters and over 2,000 unions do not have suppliers (Galway, 2000; PAC, 2006).

When the commercial private sector saw a market for latrines emerging they responded by selling simpler and cheaper models, which became very popular. In 1999, Rahmatullah and Ikin reported that there were some 4,500 latrine producers in Bangladesh, of which over half were in the private sector (Fröhlich, 1999). Robinson and Paul (2000) give a total of 3,000. The estimated sales value grew from US \$1.5 million to US \$4.4 million in three years (PAC, 2006). With so many more private outlets selling parts cheaper and closer to people, the subsidised centres became overstocked. In 1993

DPHE cut their production and in 1996 UNICEF stopped supplying cement. However, DPHE still employs some 2,000 sanitation entrepreneurs (Galway, 2000). It is not known how many would survive on their own. A study by NGOF revealed that micro enterprises can hardly sustain on latrine parts only; they need to diversify their production (J. Verhagen, pers.com.)

The Indian Government and UNICEF copied the approach in India, financing local groups such as women's groups to set up production centres and village entrepreneurs to open sanitation markets and shops. The entrepreneurs get training and a starting-up credit which they have to pay back. The first Rural Sanitary Marts (RSM) were set up in Allahabad, UP in early 1990. The idea was so attractive that it was scaled up before it had been properly tested and was adopted as the standard approach in all sanitation programmes in which UNICEF-India was involved. Expansion was much slower than in Bangladesh. According to Kolsky et al (1999) there were about 450 RSMs in various states in India in 1998, but this number is probably higher, as Uttar Pradesh had 309 RSMs (Mendiratta, 2000) and Midnapure, West Bengal 330 (Jacob, undated). However, as RSMs are not always created in response to growing demands, it is doubtful how many are profitable. Consolidated data on RSM performance, nor a rigorous external evaluation were found.

Whether RSMs are profitable depends on their prices and minimum annual sales. Under the total sanitation campaign, each block can establish one RSM (usually started by an NGO, CBO or the Panchayat). The Government will provide a maximum Rs 3.5 lakh (US \$88,844) for the

construction of a shed/showroom, acquisition of equipment, training of masons and motivators, promotion campaign materials and a salary of Rs 750 per month (US \$19) for two years. Cost-sharing is 80% central government and 20% state government. An RSM will break even when it constructs around 1,000 toilets in a year, e.g. 700 toilets with squatting plates and 300 other toilets (Gupta et al, 2005). However, it is unclear if these sales would also cover the costs of the salaries. No data was found on the sustainability and profit of RSMs in the TSC.

An important aspect of local production and construction is the number of poor women who get work and an income from improving village sanitation. East Midinapure in West Bengal for example has 25 RSMs, which employ over 300 female masons (Cheruvari, 2006). In the state of Kerala, at least 1,200 poor women were trained as toilet masons in local enterprise groups (Sijbesma, 2006).

From numerical to behavioural results

A significant shift occurring in the region is the reporting on sanitation behaviour, especially the shift from numbers of toilets to ODF communities. However, ODF needs verification, including the hygiene of the installed toilets (especially those shared by many such as in schools) because many soiled toilets, filled with flies, still constitute a high health hazard. In the programme in Maharashtra, an independent agency (AFPRO) verified the ODF status of communities that had applied for the financial award for this achievement and found the claims to be partly correct (Jain, 2007), but whether these villages also sustained their status after outside inspection visits took place is not clear.

Conventional monitoring of financial and physical progress without attention to actual use and ODF status impacts still continues, for example, in the national sanitation programmes in Bangladesh and Pakistan (Rahman and Gosh, 2006, Khan and Javed, 2007, Khisro et al, this book Chapter 15). In the programme in Kerala, latrine use and hand washing were monitored by the NGO (Kurup et al, 1996), but there is no evidence that the state level has continued this. As far as is known, no independent assessment has either been done of the ODF status of CLTS programme villages. VERC, for example, was not systematically monitoring and collating field data at district level (Allan, 2003).

To be effective, good hygiene and sanitation must become lifelong habits. Data on longer term practices such as improvement or decreased toilet use and hand washing over time are still rare. The workshop had two papers on this subject. VERC's study of the sanitation ladder included also movements up and down the hygiene ladder between 2001 and 2006. The small sample had qualitative data showing that hygiene did indeed improve over time (Saha et al, Chapter 6 in this book). A study in Kerala showed that votes from men and women on consistent latrine use and hand washing after defecation differed significantly (94% and 71% by women, 59% and 48% by men). The older the hygiene programme (one to nine years), the less women reported positive habits, but the drop was quite small. Nine years after the programme, 80% of the women still always used a latrine. For the men there was no significant reduction in practices over time (Zacharia and Shordt, 2004). Safe defecation by children is still a neglected area (Khisro et al, Chapter 15 in this book).

Areas that need to be developed

Ten areas that are undeveloped, or which have been overlooked, are presented. These are:

- 1 Households are diversified, not uniform
- 2 Assessing cost-effectiveness of promotion
- 3 Targeting subsidies with equity
- 4 Upgrading toilets
- 5 Developing environmentally safe solutions
- 6 Programming for dry toilets
- 7 Improved sanitation in urban slums
- 8 Going for short- or long-term programmes
- 9 Sustainability of facilities and programmes
- 10 Institutional and human capacities

Diversified households

All reviewed sanitation programmes in South Asia focus on the household as the lowest level of decision-making on toilet design, installation, financing and use. Yet there are important differences both within and between households that are not presently addressed. Within households, men and women have different interests in and priorities for latrines. Women and adolescent girls have a higher latrine demand than men, because they face more restrictions and hardships, such as long distances to find privacy, the necessity to go out under the cover of darkness and cut down eating and drinking during the day to lessen daytime defecation and urination, harassment and safety hazards during walks to common defecation areas and the stench and dirt of these areas. They also need toilets suitable to observe menstrual hygiene (Ahmed and Yesmin, Chapter 21 in this book).

Men have fewer problems and are motivated by other benefits, e.g. the higher status from a toilet to the house and the provision of privacy and safety to their women folk, a higher house value and increased income from less illness and work losses, and lower expenditures on transport and treatment in case of illness.

There are also differences between groups of households, which related to differences in socio-economic status, and occupational and physical conditions. With latrines, for example, business people do not have to leave their premises or no longer risk losing income. Landowners, small subsistence farmers and labourers on the other hand can already defecate on the land they own or work in, while those defecating without such ties increasingly risk social conflicts (Kar, 2003). This means that different occupational groups have different reasons and urgency to want to have and use toilets and are also interested in different models and locations. While a middle class business couple may go for a convenient and high status toilet with bathroom inside the house, landowners and users may go for the lowest cost Arbor toilet (NWP et al, 2006) on the land, or for the cat method in the field and a pit latrine in the home yard.

The same diversification goes for communication channels and materials. Printed media and materials reach men and the better off more easily than women and the poor, with their lower literacy. Men and women also use different communication channels and are interested in different sanitation aspects. Nor can poor and young women and men freely mix and react in group meetings, even when

both sexes have their own meetings (Sijbesma, 1998). Communication strategies should therefore be gender specific.

Cost-effective promotion

Another aspect that is underestimated and underdeveloped is on effective (including more cost-effective) promotion programmes of improved sanitation and hygiene practices. From general research it is known that effective promotion uses a mix of mass information and personal contacts for conviction, both based on formative studies. In contacts, it is important that the facilitators do not impose, but help participants evaluate existing practices and identify and decide on improvements. Alternatively, communities can be facilitated to do their own participatory assessment and planning and implementation of hygiene action plans.

South Asia has few studies on effective hygiene promotion. In Bangladesh, Boot (1995) reviewed eight programmes. She found a conspicuous absence of the Ministry of Health and a superficial and haphazard delivery by its staff. Lack of good planning based on baseline data, no participation, untested messages, little or no monitoring and doubtful programme sustainability are other findings. In the mid-1990s, CARE Bangladesh implemented the Sanitation And Family Education (SAFE) project in 19 villages in two unions in almost 37,000 households. Contents were based on locally specific good and risky habits. In one union, small group discussions with women and men were used, in the other children and leaders were also involved. After one year, both approaches showed significant reported and observed differences with the control

area, but the two approaches did not show very different results (CARE, 2007). A participatory and integrated approach with male and female local promoters, PRA, action plans and involvement of local government showed considerable improvements in latrine building, reduction of open defecation, availability of water and soap and good hand washing practices, but without details on ways of measurement and costs of promotion (Alam and Huque, 2006). Unique is the early work of Hoque and Briend (1991) on the effectiveness of promoting hand washing with ash or mud instead of (often unaffordable) soap. While washing with water was as ineffective as not washing at all, washing with soap-substitutes effectively removed faecal bacterial. The sample was small, however (20 women).

In India, WSP reviewed three large hygiene promotion programmes (564-1,100 villages each). The first two used mass information with interpersonal contacts of the didactic type and the third participatory methods. The third was said to have had better results, but without giving evidence (WSP, 2000). A six-country study on the sustainability of improved hygiene after promotion had ended included a programme in Kerala and Nepal (Shordt and Cairncross, 2004). The research was carried out by the implementing agencies, one to four years (and in part of Kerala up to nine years) after ending the hygiene promotion. Using four different ways to measure the impacts of hygiene promotion on hygiene practices, the researchers proved that good hygiene promotion is significant correlated with the use of toilets and proper hand washing at critical times. They also showed that behaviour had hardly deteriorated over time. Differences in access to water and duration of

promotion did not affect these findings. When promotion efforts are intense and have a strong focus on reaching both men and women and the poor, then differences from women's education level, the socio-economic status of the communities and the differences in hygiene practices between women and men also became less important.

Only a few small studies of cost-effectiveness of sanitation and hygiene promotion programmes have been carried out in South Asia. A study in one intervention and one control city in Kerala, Bangladesh and Sri Lanka showed that a gender-sensitive participatory approach resulted in total access and use of toilets in the Bangladesh case and increases to 91% and 89% in the sites in Kerala and Sri Lanka; with no, or minimal, improvement in the control sites. Safe disposal of children's stools, quality of constructed toilets, toilet hygiene and segregation and composting of household waste also increased significantly. Overall, the interventions were over 30% cheaper than the compared government programmes (IRC and partners, 2006).

In Mirzapur, Bangladesh, the 1990 cost of hygiene promotion per person was US \$3.60. Results were that 90% had installed toilets and 98% reported use of these toilets by adults. Observed cleanliness was 73%, against 2% in the control area. Ash often replaced mud for hand washing and was found in 62% of the visited households, but in only 1% of the control sample (Aziz et al, 1990). In a 1994 study, however, Hoque et al found only 38% clean and working toilets. As neither study reports on how cleanliness was measured – observed (smears of) excreta or muddiness? – it is not possible to establish the validity of this information. Safe faeces

disposal of children remained a weak point in both cases (Aziz et al, 1990; Hoque, 1994). Alwis (2006) reports on effectiveness measurements with quantified participatory methods followed by hygiene promotion through children in a district in Sri Lanka, but impact data are not yet present and information on development and recurrent costs is missing.

Allan (2003) gives a cost of US \$1.50 per capita for achieving total toilet coverage and use through CLTS by WaterAid Bangladesh and VERC. This is at least half that of the cost per installed toilet by other sanitation programmes, but does not take into account that the average toilet in the CLTS is of a lower quality (though sufficient to meet its purpose) than the toilets with which they are compared (e.g. single versus double pit and low versus high durability of outhouses). Furthermore, her evidence comes from a study in a non representative sample of four out of 100 villages. Clearly, there is an urgent need for more research on the effectiveness and cost of different hygiene and sanitation promotion approaches in larger and more representative study samples.

The effects for gender and the poor deserve more attention in future studies. Under the given gender relations, toilets may increase women's and girls' workloads of water collection and cleaning, especially in poor households with a lower access to water supply. Also women's opportunities to become consultants (Khan et al, Chapter 14) and who do the work on digging (Khisro et al, this book, Chapter 15) are areas of attention. VERC is planning to study gender in its CLTS programme (Shayamal et al, Chapter 20 in this book).

Targeting subsidies with equity, transparency and accountability

In the section on *Phasing out direct household subsidy* above, it was shown that subsidies only make sense if they are not unsustainably high, are targeted to the ultra poor and evidence is available of their actual reach and use as intended. Tested mechanisms exist, but they seem not to be widely used so far. One is to display a list of local families, which the local elected sanitation committee (rather than a politician) have chosen to get a subsidised toilet and then investigate any complaint lodged by the local community. This was done in the Panchayat-managed sanitation programme in Kerala (Shordt, 2006b) but may have disappeared now that the programme has been scaled up to the whole state.

Another mechanism is to use PRA welfare classification to determine the characteristics of the worst-off and make a stratified social map which includes these households (Box 6 and Ahmed – this book, Chapter 22). Latrine subsidies and loans for the own contribution then go to the locally worst-off households and are recorded in the map along with the latrines when these have been built and have been proven to be used for excreta disposal. Because poverty is so locally-specific, targeting is best done at the lowest level and in a participatory and transparent manner that can be and is publicly accounted for (Ahmed – this book, Chapter 22).

Upgrading toilets over time

The principle of demand responsive sanitation (DRS) is that users install the toilets that they want and can afford. Through this approach, households install a range of toilets, from a very basic pit latrine of lowest cost, built in the yard

BOX 6 Targeting and accounting for toilet subsidies to the ultra-poor

The characteristics of a very poor family in urban and rural areas in different parts of a country can be quite different. Country or state wide poverty criteria are therefore only crude instruments for allocating toilet subsidies and have a doubtful validity. PRA tools and techniques help in identifying and using locally specific poverty indicators. They make it possible to ensure and provide evidence that toilet subsidies benefit only the poorest households in each community. The following is a typical procedure:

To determine the local indicators of poverty, the facilitators invite a gathering of community members to form three sub-groups. Each group then makes a drawing of a typical household: one very fortunate in life, one very unfortunate in life and one in-between household. (If so wanted, a fourth drawing of an ultra unfortunate household can be added). The facilitator then asks the groups to present their drawings and explain the indicators that they used. The other groups can comment and add to the indicators if they want. After completing, the group calculates the number of households in each category. The facilitator asks the plenary group to draw a map of the community, giving each house the agreed colour or shape of its welfare category. The group then draws in the houses with a (sanitary) latrine. The very/most unfortunate households without (sanitary) toilet qualify for a subsidy. The map is publicly displayed and each household given a toilet subsidy is registered in it.

with free material to a fully equipped and tiled bathroom inside the house. Included in the concept is that households may initially build a lower cost model which they grade up over time, e.g. adding a permanent roof, replacing curtains or screens with doors and cementing and tiling floors and walls. Actively promoting upgrading and giving examples of models and costs can help more

people build easier-to-clean, more durable and more attractive multi-purpose sanitation facilities.

To what extent and how people upgrade toilets is only recently being documented. A study in four CLTS villages in Bangladesh showed that upgrading happened when families replaced their old pit latrine by a new one (Allan, 2003). A more recent study with 428 households that installed toilets in three different locations between 2001 and 2006 taught that in all socio-economic categories (hardcore poor, poor, middle class and better off) families had followed a 'gradual progress principle' of slowly replacing low-cost models with improved models. The movement was best in poor households, followed by the middle class. Hardcore poor had the slowest climb (Saha et al, this book Chapter 6). As for each category, actual numbers of households that moved upward from model to model have not been given, it cannot be determined which were the easiest and hardest steps for each group.

Environmentally safe solutions

A lot of experience has been gained with low-cost onsite toilets. There are, however, specific environmental problems that have not yet been resolved: programmes in rocky and dry areas, areas with high watertables (see e.g. Khisro et al, Chapter 15 in this book), flooding and easy pit collapse, and safe emptying and end-disposal of uncomposted sludge. In high watertable areas, pits can only go down to the highest point of the variable watertable to avoid filling with water. Moreover, excreta that dissolve into water will pollute the watertable from which drinking water may be drawn, e.g. by handpumps. The same problems can affect septic tanks.

A bacteriological sample survey of groundwater in Goa, India showed that the E-coli load was 1,000 times the permissible drinking water limit, while in Kerala 90% of the shallow domestic wells were bacteriologically contaminated (WSP, 2005). In areas where disinfected drinking water is distributed under 24 hours pressure and at close distance, there may be no serious problem, but this is different when contaminated shallow groundwater layers can enter the piped system, are the main source of drinking water, or are the major fall-back resource in case of longer lasting breakdowns of piped systems. Safe end-disposal is also a weak and costly aspect of the system of primary and secondary sewerage under the partnerships between slums, municipalities and NGOs in urban Pakistan (Qutub et al, this book Chapter 4).

In high groundwater areas, the common solution has been to raise the soil and build the pit latrine into the mound. Disadvantages are that this increases the cost and does not solve the pollution and backflow problems from the moment the surface gets flooded. In these conditions, there is a growing appreciation of the alternative of dry toilets (See also the next section).

Inevitably, every toilet pit in use gets eventually filled up. There must be millions of such pits in the region. In spite of this, emptying full latrine pits is a remarkably blind spot of sanitary toilet programmes. Owners who have space usually abandon the full pit, dig a new pit, and cover the old one with soil. This happens especially when it is easy to dismantle and rebuild the superstructure or to build a new one. Alternatively, the owners themselves or a hired latrine pit emptier may dig a second pit and empty the contents of the latrine pit into this hole, or dispose the raw sewage

untreated in the nearest surface water or a nearby ditch. A variation is to connect the new and the old pit with an overflow (Kar and Pasteur, 2005).

Probably because of the stigma involved there is a lack of systematic data on who empty full pits, at what costs to whom, what happens to the sludge, and what negative and positive effects accrue to different types of people. In India the central government banned scavenging in 1993, yet it still prevalent in 21 states. The government estimate of scavengers is 60,000; NGOs give an estimate of 1.5 million. Some 90-95% of them are women, earning sometimes as little as Rs 1 per household per day plus some food. Pit emptying may earn as little at Rs 30 to 50 (80 dollar cents to US \$1.26) per pit (Therese Mahon, pers.com.). In Chittagong, in Bangladesh, the fee for emptying one pit fell from Tk 200 (US \$3.64) to Tk 100, indicating a higher demand and more private sector competition, but this data is based on one respondent only (PAC, 2006).

The same lack of information exists for the emptying of double vault pour flush and dry toilets. Theoretically, the owners will take out and sell or use the composted contents of the first pit when the second pit gets filled up, but the work may also be done by the informal private sector. Information about the scope and economic importance is, however, totally lacking. Emptying full toilets may constitute a significant income generating activity for poor people, including women, if the social stigma is counteracted by proper tools, protective clothing and a well-paying job (Eales, 2005).

Mechanical emptying which is suitable and affordable in densely settled slums is healthier and

socially more acceptable. The first experiences with two Vacutugs (suction pumps with reservoirs and pipes mounted on a small diesel-propelled cart or hung behind a small truck) in Dhaka showed that so far the service can not even cover all recurrent cost (Rashid, unpublished paper). Financial viability may however improve with a proper business plan with effective marketing and optimisation of the logistics and management of service delivery.

Scope for dry toilets

A typical low-cost dry toilet has a cement slab over two containers, each with its own squatting hole for the disposal of faeces, and a third hole in the middle for urination and cleansing. The urine and water are directed straight to the outside of the outhouse, where they can be used as urine: water mixture of 1:5 to fertilise trees, bushes and plants (Rajbhandari, Chapter 5 in this book). The excreta are deposited during about three months, after which the user family covers the hole and shifts to using the second excreta disposal opening. After another three months (the exact time depends on local conditions), the first load has composted and, taken out, can be used for gardening.

Dry toilets have two advantages in high watertable areas: the containers for the dry excreta are built above ground and dry excreta compost quickly, the exact time depending on temperature, people's diet and operation (e.g. mixing with ash). Dry toilets have a lower volume of still dangerous faeces (in terms of bacteria and worm eggs) than a wet mixture of faeces and urine, and the dry conditions speed up the killing off of the germs. In floods, much less raw excreta have a risk of floating out than when the area has single or double pit toilets,

so that contamination of land and groundwater is less severe. As far as is known, different germ loads during floods have not yet been calculated.

While fertilising with human excreta has a long tradition in China and Vietnam, such use is often not considered acceptable in other cultures. Yet Quazi (2006) and Quazi and Islam (this book, Chapter 19) found that despite the Koran's edict and Islamic culture of minimising contact with human excreta, farmers in Bangladesh grow trees and plants on full latrine pits and mix human and animal excreta and kitchen waste to increase the amount of free manure.

Dry toilets need relatively more space and are relatively expensive, but are still competitive to other models, such as the double vault pour flush toilet and septic tank. In peri-urban Kathmandu, Nepal, a dry toilet with a complete superstructure cost the equivalent of US \$230 (Rajbhandari, this book, Chapter 5). In Tamil Nadu, the direct unit cost was Rs 7,000-8,500 or US \$178-217 (Kumar and Gopalan, 2007). Investment costs of INR 3,500 (a cut of 44%(!) through cooperation of an NGO and a women's group, Calvert 1997) and INR 2,400 (Mara, 2005) are also mentioned. Making investment cost comparisons is difficult, since currency conversion, cost-increases over time, subsidies and design lives are disturbing factors (Smet, 2007).

In Chapter 5, Rajbhandari shows that in peri-urban Nepal, the underground part of the double vault eco-toilet costs the same as a single vault pour flush toilet and is cheaper than the double vault pour flush latrine, but both are still expensive for a poor household. Only the simple direct pit latrine is relatively cheap, at one third of the cost of the

eco-toilet. However, if the value of the urine and compost as fertiliser are deducted, the cost of the eco-toilet earns itself back in a period of five years. A country-level study of latrine costs gave still higher unit costs for a dry toilet (NRS 14,285 or US \$285 instead of US \$230), almost 2,000 Nepalese rupees more than the double vault pour flush toilet. However, when the costs of treatment are included, the unit costs of Ecosan toilets (NRS 14,285) are still much lower than those of septic tanks (NRS 18,786) or flush toilets with conventional treatment (NRS 21,550) or reedbed filter treatment, which at NRS 29,360 or US \$459 per household is the most costly option.

The estimated recurrent costs of a new community-managed reedbed filter in Sunga, Nepal, is only NRS 625 per household, however, and will drop to NRS 125 per household when operated at full capacity. This amount does not include the cost of the water supply for flushing. The capital costs of the system was NRS 12,500 per household, which equals the capital cost of double vault pour flush toilets and eco-toilets (Tuladhar et al, Chapter 7 in this book), so for urban settlements with no space and productivity demands for eco-toilets this may be a good alternative to conventional sewerage systems as well as dry and wet onsite double vault toilets.

Ecosan toilets were found especially suited to areas with peri-urban agriculture where water is scarce or relatively costly, soil fertility and productivity declining and artificial fertilisers expensive (Nepal imports them from India). Nevertheless, so far only 517 eco toilets have reportedly been installed over a period of five years. Positive outcomes are that year round use by all family members is high (93%)

and that 98% of the users and 89% of their neighbours support the technology (Rajbahandari, Chapter 5 in this book).

The big upfront investment is a serious drawback, as the system becomes affordable when the value of the fertilisers is deducted (Kvarnström et al, 2006; Rajbahandari, the book, Chapter 5). Links of sales to credit, a common practice of small entrepreneurs selling toilets/toilet parts in Bangladesh, may make a difference. The first sanitary mart for eco-toilets opened in Trivandrum rural district (Kumar and Gopalan, 2007), but information on range of models, prices, sales and credit facilities could not yet be found. In Nepal, links with a credit scheme and building off of the 60% subsidy are now planned.

There is a high need to experiment with a range of cheap to more expensive models, especially in areas with a good potential for dry toilets, such as areas with high watertables and frequent flooding, rocky soils, a lack of water for flushing, a market for natural fertiliser (such as peri-urban communities with market gardening), poor quality soil and high fertiliser prices, and areas where pit emptying is costly. In the greater Kathmandu case, where dense urban settlement makes mechanical emptying of pits costly and sometimes impossible due to lack of access, husbands earlier forbade their wives and daughters to use the pit latrines for fear of filling up. They now encourage them to use the dry toilets to maximise outputs. Very simple dry latrine models may include single pit latrines with shiftable superstructures which householders use only for stool disposal, and a bucket or other receptacle urinate in and wash over. When the pits get full, the households build new ones, shift the

superstructures, cover the old pits with soil and either empty them after the contents have composted, or – when space is not a constraint – simply plant a tree in the old pits for timber, firewood or fruits (Smet, 2007). The reported lowest cost of this model is only US \$2-5 (NWP et al, 2006).

Safe sanitation in urban slums

Urban growth in South Asia is high. It happens not only in mega cities but also in medium size cities and towns. Such centres are seldom equipped for dealing with sanitation for large numbers of poor people. Authors at the South Asian workshop presented four types of solutions: (1) partnerships between municipalities, NGOs and communities enabling slum households to install onsite toilets (mostly pour flush, but in Nepal also dry composting toilets) usually still with a subsidy, or a combination of a subsidy and loan (Ahmed, 2006; Rajbahandari, this book Chapter 5); (2) NGOs helping households in dense and poor urban settlements to build a row of communal toilets, also called toilet clusters, of which one series is for men and the other for women and children; (3) partnerships to establish community-managed sanitation blocks: small buildings with separate toilets, bathing facilities and water supply (and sometimes also laundry provisions) for women and children on one site and for men on the other site (occasionally, both groups have separate buildings) and (4) partnerships between slum communities, local NGOs and municipalities to install shallow sewers financed by poor households and linked to the city mains, a model mainly followed in Pakistan (Qutub et al, this book Chapter 4; Welle and Wicken, this book Chapter 8). Not covered

are other alternatives, such as community-managed shallow sewerage using baffle reactors. However, not enough data was available for this workshop to make a comparison between these various options.

A lack of space, legal status and social cohesion often limits the possibilities for individual household toilets in low-income urban settlements. So, many programmes focus on community-managed communal provisions. However, it may be possible to have community led sanitation programmes for private provisions in locations such as CLTS in locations where space for settlement is made available and people are allowed to settle. This is clearly an area for experimentation when municipalities want to reduce unplanned urban growth, but are themselves not in the position to start site-and-service schemes.

Municipal service, sanitation blocks have been unsuccessful, because of their bad hygienic conditions, bad smell, inconvenient locations and harassments and safety risks for women and girls. As one of the first organisations the Indian Sulabh Saushalaya Sansthan (SSS) began to build and operate commercial sanitation blocks with toilets, washing and bathing facilities and a paid operator and cleaner. SSS paid two workers from the user payments to keep the provisions clean and in good working order. These pay-and-use blocks have especially been a success when sited close to places visited by many people with a good payment capacity, such as stations and markets. About one third of them make a profit, which SSS uses to cross-subsidise the others (Sulabh, pers. com). An early study showed that especially poor, but earning men used the blocks. For women and

children their accessibility was much lower, even though use by children was free. Reasons were that the blocks were not centrally located in the slum areas at close walking distances and could not be used after dark (Vijayendra in Sijbesma, 1981). How this is now and which blocks can be sustained without co-financing from other funds is not clear.

Because of the poor service of municipal toilets and the cost of commercially operated sanitation blocks, several NGOs have built (or convinced municipalities to build) user-managed sanitation blocks. Sometimes the blocks are only for women and children, sometimes one section is for women and children and one for men. Occasionally, blocks have special toilets for children (Khandaker and Badrunnessa, 2006). Adaptations for the disabled and for menstrual provisions also sometimes exist (Ahmed and Yesmin, Chapter 21; Ahsan et al, Chapter 2). Whether the blocks are designed and located together with the future users or by the NGO and/or municipality is not always clear. A local group (often a women's self-help group) runs the sanitation block on a household subscription and/or pay-and-use basis. The aim is usually to provide a basic sanitation and hygiene service on a cost covering basis and if possible as a small private enterprise.

In Dhaka and Chittagong, NGOs give rent-free loans at a value ranging from US \$ of c. GBP £2,778 (US \$5,600) to build a water supply and sanitation block consisting of up to 12 toilets (six for women, six for men), two urinals (for men), a septic tank and an underground water reservoir with one or two handpumps on top for hand washing, bathing and laundry. The design is for 500 users per day,

but a study showed that the number of users ranged from 430 to 717 per day. A smaller facility for some 150 users per day consists of a row of five toilets with a septic tank or sewerage connection but no water supply⁷. An eight-woman committee runs the service, sets the tariffs, cleans, arranges for repairs and collects and manages the payments. A five-man committee assists in negotiation and security during construction and operation. Alternatives are to install or share private toilets against payment. Monthly payment is Tk 30-40 per household per month. In some cases, payment is according to household size and/or per visit (and types of use?) (Hanchett et al, 2003). Ahsan et al (Chapter 2 in this book) found that out of 49 communal provisions in four cities, all but one met the design standard of maximally 50 users per toilet. Operation and management is by a hierarchy of local committees. They allocate a weighed tariff for repaying the construction loan. To arrive at the full investment fee, the total construction cost is divided by the number of user households. The committees define four types of households: better-off, intermediate, poor and hardcore poor. Better-off households must pay the investment share in full in a number of monthly instalments agreed on between the managing committee and the NGO. Hardcore poor may pay as little as 5%. The difference is made up by WaterAid Bangladesh. There is, however, no information on the O&M tariffs, payment experiences and degree of and variation in coverage of recurrent costs.

Research by WaterAid in Trichi (India) and Dhaka and Chittagong showed that paying back the construction cost is only possible in a few cases and that a considerable part (two-thirds in Trichi, where charges include electricity) could also not

cover the monthly running costs. The blocks did meet a considerable demand: in the Bangladesh, 35% (incl. 37% very poor) still used unsanitary toilets (mainly slabs over drains or water bodies) against almost 50% in the control area. Open defecation was limited in these dense urban settlements, but this may only be for adults, and not for children below the age of ten. Ahsan et al report in Chapter 2 that in a quarter of the communal toilets, users never dispose any infant excreta, but based on statements from users and operators in another one third, *all* infant stools are brought to the latrine. This seems very high and may stem from socially desirable rather than true answers, so a more thorough investigation is indicated.

Although sanitation blocks are probably the most realistic solution for low-income and densely settled urban communities, and paid group or community management of the blocks the best management options, there are quite a number of issues that need further investigation and decision making. The first issue is that of the best mix of service level: how to choose the kind of location, size and type of facility to meet the needs and demands of all people in the 'sanitation catchment area' in such a way as to become fully sustainable and make an end to unsanitary sanitation? The right mix of size, design and financing (including the share of the municipality) has clearly not been found. The second issue is that of equity. User households differ in their payment capacities and in the degree of benefits: those who live close can use the facilities more easily and need to queue less. There was no differentiation of O&M tariffs, however, although some committees allow the very poor to pay less. In gender division of work and

⁷ A block with eight cubicles (three for women, three for men and one each side for children) without further facilities was cheaper, ranging from US \$2,900 to US \$3,750 (Khandaker and Badrunnessa, 2006).

benefits, information varies. While Ahsan et al (Chapter 2, this document) reports a balance (as many facilities maintained by women and by men, or both), women do most of the work as volunteers. Nor do poor women sit on committees: they cannot afford to take time off from income generating work. A third issue is that of adjustment to special user needs. As mentioned, it is not clear to what extent users take part in decisions on designs and locations. Use by children has been reported (Ahsan et al, Chapter 2 in this book), but the methods (unsystematic interviews of users and operators) are too general for reliable data.

The papers in this workshop brought out the importance that women participate in adjusting designs for use by children and during menstruation and if designs and locations are suited for disabled people (Ahmad and Yesmin, Chapter 21, Ahsan et al, Chapter 2; Pradhan et al, Chapter 24). Jones et al (2002) remark that because many Bangladeshi believe that impairments are contagious or as a punishment, disabled people may be prevented from sharing latrine facilities. Focus group discussions reported by Ahmed did not bring out such exclusion, but such practices may not be reported unless specifically investigated. Having a toilet at home clearly benefits very poor people with a handicap in particular (Ahmed, 2006). A first action by NEWAH and WaterAid in Nepal revealed the barriers, implications and possible actions and strategies to adjust sanitation and water supply facilities to the needs of the handicapped (Pradhan et al, this book, Chapter 24)

In Pakistan, the major approach to urban sanitation for the poor is community-managed piped sewerage projects. Low-income households are helped to form lane organisations and finance,

manage and maintain sanitary latrines in their homes, underground sewerage lines in the lanes and secondary sewers in their settlements. The government is responsible for providing main sewers and treatment plants. A basic requirement of this option is that households have the space to install a pour flush toilet that connects into the sewer. NGOs, with the Orangi Pilot Project Research and Training Institute (OPP-RTI) as pioneer/trainer, provide social and technical guidance to both community and government, facilitating partnerships.

The *direct* costs of shallow, community-managed sewerage are relatively low. Haider (Chapter 3 in this book) reports that participating households pay a total investment cost of US \$40 for a simple pour flush toilet and its share of a lane sewer and a collector sewer. Taking an average value of 51 Pakistan Rupees for 1 US dollar during the project period, the investment cost for a pour flush toilet and lane sewer in Quetta was US \$28-56 per participating household (Qutub et al, Chapter 4 in this book). However, this cost neither includes the cost of the community motivation and organisation nor the cost of the secondary sewers and end treatment. In the Quetta programme, the direct investments by the user households were only 18% of the costs for the investments at the community level. The costs of secondary sewers and treatment are still additional.

The approach has so far been extended to 279 settlements in Karachi and 13 other cities, covering a population of more than two million. The Orangi and Baldia projects are extensively documented. Bakhteari and Wegelin documented the Baldia project in 1992. On the Orangi project, the IRC Documentation Centre alone has more than 55

documents. The project also has its own website with quarterly reports (<http://www.oppinstitutions.org/>). The Orangi project in particular has been acclaimed as an example of how the poor can transform their environment with mainly local means, although the British House of Commons (2007) criticised its limited engagement with government, which it said hampers scaling up. On which data this observation is based is not clear, however, since as far as could be ascertained, no independent evaluations have been carried out of the current status and strategies of community sewerage programs. This is further addressed in Sections on *Validating claimed successes* and *Safe end-disposal*.

Short-term limited or long-term comprehensive?

Research on health benefits has shown that the greatest impact on diarrhoeal disease (highly prevalent in the tropics and the second highest cause of death of children under five) comes from a wide adoption of three key practices: clean sanitary toilets used by all, hand washing by all with soap or soap alternatives at four critical times, and safe storage and drawing of clean drinking water. (WHO, 1993). Thus, it does make sense to address each of these practices through social marketing.

In contrast to IEC (Information, Education and Communication) campaigns, which focus on the information that agencies want to be transferred, social marketing begins with what the consumers want and for which reasons (Scott, 2005). Shordt (2006a) reports how such a campaign in Bangladesh failed for lack of adequate attention to social marketing requirements. UNICEF and DPHE, and

some NGOs now give training, materials and access to credit to private entrepreneurs to enhance their sales of toilets/toilet parts. Limitations not yet solved are that small providers can only do low-cost research and development, and that when they develop innovations they cannot be patented (Robinson and Paul, 2000). WaterAid India and its partners also use social marketing of toilets to increase local demand, installation and use, which had better results than the original IEC approach. Household subsidies still constitute one third of the investments, but will be phased out (WSP/WAI, 2000). A literature review and formative research identified that a key area of research required is how small business may be supported to improve their overall delivery of sanitation facilities (Budds et al, 2002).

Other products/practices promoted through social marketing are hygiene kits for delivering babies leading to significantly more hand washing with soap and reduced infections in Nepal promoted by the NGO PATH (PATH, 2007) and hand washing with soap promoted by the commercial private sector of Hindustan Lever, a daughter company of Unilever. The company has partnered with existing micro-credit programmes to help poor rural women set up small scale businesses that promote and sell the company's products. Hindustan Lever provides training and local marketing support including a tool to show how soap cleans hands better than water alone. The Shakti project started in Andhra Pradesh in 2000 and has since expanded to 12 other Indian states and to Sri Lanka and Bangladesh (GPH, 2005).

Promotion of key hygiene changes has to be realistic. In four urban slums, householders could not always attend sessions or practice the messages

(Ahsan et al, this book, Chapter 2). In post earthquake Pakistan, combining the provision of key hygiene goods with social marketing through a mix of mutually reinforcing radio and interpersonal messages had a crucial positive effect on hygiene in emergency condition. Rapid assessment of local risks (respiratory and eye infections in children rather than malaria) would have improved the effectiveness even more (Khan et al, this book, Chapter 23).

CLTS campaigns share with social marketing that they focus on one key indicator – a total absence of open defecation – and the reasons why different groups of people want to achieve this goal. At the same time, effective CLTS programmes have not stopped at an ODF status – they went on to improve other essential behavioural aspects such as toilet maintenance and hygiene. These programmes see an ODF status as a necessary, but insufficient condition to good environmental sanitation and hygiene and therefore have longer intervention times and aim at more comprehensive capacity building to plan, realise and sustain wider sanitation and hygiene improvements (Huda, Chapter 11; Khisro et al, Chapter 15; Saha et al, Chapter 6; Zacharia and Shordt, 2004). The relative costs and effectiveness of the approaches have however not been investigated.

Although social marketing is promising, there is thus a lack of quantitative evidence over time on the overall risk reducing impacts of these approaches, both alone and in comparison with approaches that are more comprehensive. The latter types of programmes aim at building the capacities of communities to investigate, analyse and effectively and lastingly reduce and eliminate the

whole range of risky conditions and practices. Studies on the costs and effectiveness of both approaches would aim at the sustained adoption of improved practices and the benefits for poor people's livelihoods.

Sustainability of facilities and programmes

Achieving the MDGs for sanitation and – in time – freedom of open defecation only make sense if (1) existing households continue to use, empty and (re)build sanitary toilets and (2) newly formed households also build, use and sustain such provisions. There is a surprising lack of information on what happens on both points after promotion programmes have ended or moved to new communities. Smet (2007) mentions one study in Tanzania where households did not build any more VIP latrines after the project and its subsidy had ended. Allan (2003) found that at the end of a toilet's life, households replaced the low-cost toilets they had built with their own resources with the same or better models. However, this study was limited to four villages with a specific situation. As pilots, they received an intensive programme and frequent visits from interested outsiders. A recent study by VERC gives more evidence of sustaining sanitation and hygiene (Shayamal et al, Chapter 20 in this book). Plans for monitoring sustained habits are under development for CLTS in Madan district in Pakistan (Khisro et al, Chapter 15 in this book). A six-country study, of which two in South Asia, studied latrine presence, use and hygiene (Shordt and Cairncross, 2004) and not whether over time existing toilets had been replaced and new households had built new ones. More longitudinal studies on toilet adoption and use and revisits to representative samples of

communities, which have been proven to be open defecation free, are urgently needed to fill this gap of insight in effective promotion strategies.

Institutional and human capacities

Throughout the region, sanitation is one of the development areas that have shifted from a centrally managed, supply driven approach to a decentralised development responsibility of local governments. Organisational and human capacities that will determine the performance and results occur at three levels:

1. **Lowest (local) government level.** The lowest level government – such as the elected Local Government Councils have many tasks: assess local situations, review results and decide on the areas for improvement, plan action plans with participation of local men and women, form (water and) sanitation committees and/ or CBOs dealing with sanitation (such as Women Self Help Groups), assist and supervise the work of these committees/CBOs, e.g. in promotion, mobilisation, financing and management, account for support to the worst-off households, monitor results (including quality of work, abandonment of open defecation and adoption of improved hygiene), account for programme performance, including financing and financial management, solve problems at the lowest level and alert and gain support at higher level for issues that cannot be solved locally;
2. **Intermediate level support (often the districts).** This level provides the immediate support services for implementation at scale, such as recruiting support organisations (NGOs/CBOs/private enterprises) and/or allocating government staff which allocate

government resources; facilitate community interventions; provide training; facilitate supply and functioning of material and service providers; give technical support and advice, monitor conditions, intervention programmes and results, and compile and consolidate the district data, not just during specific programmes, but as part of overall district development;

3. **Higher level government** at provincial or state and national level. The highest levels are generally expected to create the enabling environment for the lower levels to function well, such as formulating the policies and strategies and the legal and regulatory framework, providing institutional set-up, education and research and giving financial support.

In this review, most information and lessons learned relate to overall policies and strategies on the one hand, and improvement activities and results on the ground on the other hand. Policy and strategy papers gave only general descriptions of the organisational set up and human resources development. Very little information was found on the resources and capabilities at intermediate level, such as numbers and types of technical and social support staff, capacity building of this staff and the members of community organisations and local governments, quality of promotion of sanitation and hygiene, attention to gender and social equity throughout capacity building and programme implementation, the budgets and actual expenditures on the different types of support and the in-house and independent monitoring and evaluation.

Some data on numbers and types of staff for CLTS in Madan district, Pakistan can be found in Khisro

et al (this book Chapter 15). The only really detailed data on intermediate level support concern the CLTS programme of VERC and WaterAid in Bangladesh (Allan, 2003). From the intermediate level, each *Union Parishad* (UP), the lowest level of local government, gets four NGO motivators⁸. Each one works with six villages, but within them work intensively with four to five *paras* for 18 months, paying over 150 visits. This is followed by a period of 12 months during which they visit three to four times per month. Overall, a *para* may thus get close to 200 visits over a period of 2.5 years. Each motivator further forms a flexible team of Community Volunteers (CVs) which they identify during the first PRA activities. CVs visit homes, monitor progress and generally keep the momentum going for a stipendium of Tk 500 (then equal to US \$10) per day. The best CVs (now 19, sex not reported) become paid consultants at the same fee to introduce CLTS in other districts (Kar, 2003; Kar and Bongarts, 2006). Community motivators get 42 days training (Table 3) which goes beyond ending open defecation. Starting in 2000, VERC's programme was covering 433 *panas* (48 villages) by March 2003, of which 82% were open defecation free (Allan, 2003).

One important aspect of building local management capacity that is only recently being added relates to increasing programme transparency and integrity to ensure that all funds serve the intended purpose and quality of construction is not compromised. In Chapter 17 of this book, Mathew et al set out how this is being done in one particular rural sanitation programme.

Particularly challenging for the intermediate level is the preservation of sufficient quality when

programmes are scaled up: the involvement of enough community motivators, the completeness and quality of their training, the intensity and quality of their work with the communities, adequate resources for coordination, supervision and support, and ease of access to materials, trained masons and affordable solutions in environmentally difficult conditions. Implementation of the CLTS movement has reportedly spread to about 1,000 UPs out of a total of 4,470, although it is not clear where CLTS ends and the national campaign starts. It is unrealistic to assume that the above-reported thorough training and intensive approach that underlie good quality results can be scaled up to national levels. Other implementers have, for example, already reduced the motivators' training to ten days (Allan, 2003) and some UP officials have told community leaders to have all toilets constructed by a given date or household offenders will face fines of up to Tk 2,000 (US \$32) (Kar and Bongarts, 2006).

TABLE 2 Training of community motivators for CLTS programme, VERC/WaterAid Bangladesh

Subjects	No. of days	Subjects	No. of days
Basic PRA methods	10	Child-to-child learning	7
Motivational techniques	3	Health and hygiene	5
Facilitation	3	Participatory hyg. prom. tools	2
Participatory planning, implementation, monitoring	7	Training through participatory methods	5
Subtotal (1)	23	Subtotal (2)	19
		Total (23 + 19)	42

⁸One UP consists of about 25 villages. Each village has from five to over 15 sub-villages or *paras*. One *para* = 50-60 households, 1 village = around 500 households, 1 union = around 12,600 households (Allan, 2003).

The question is what are realistic planning figures for such programmes? Reportedly, the combined CLTS and national programmes have led to high coverage figures for sanitary toilets in Bangladesh. Rahman and Gosh (2006) report that from December 2004 (national baseline) to June 2006, latrine coverage has doubled from 39% to 78% in rural areas, increased by 20% to 84% in the 288 municipalities and increased in the two cities by 11% to 84%. Official estimates for the first two categories are even higher: 84% and 88%. There are, however, no independent sample data underpinning these government figures⁹ and no information on how the results were achieved, to what the extent the toilets are durable and hygienically used, if they have ended open defecation and if community capacities for sustainability have been built. To be sustainable over time, it is likely that sanitation programmes need longer term commitment and at intermediate level, enough support staff with strong facilitation skills and training, job performance criteria that go beyond numbers and sufficient career opportunities for social and technical staff to specialise in all aspects of sanitation and hygiene.

Further steps forward

The preceding sections contain an overview of the progress that has been made to achieve improved sanitation and hygiene in South Asia. On ten content areas considerable progress has been achieved, although issues for further work remain. Another ten subjects concern areas where major progress is still to be made. The papers that were presented at the workshop provide new data and insights in many of these areas. Information and discussions are both likely to influence the future

work of the workshop participants and their organisations.

A specific question discussed was whether there is a need to cooperate in advancing specific subject areas, and if so, on which subjects and how cooperation would take place. The following four areas emerged as action research priorities for regional cooperation: (1) assessing and enhancing cost-effective promotion and delivery; (2) agreement on indicators of effects and impacts as a condition to validate promising approaches (3) assessing and improving end-disposal of excreta and (4) action research on citizens voices and accountability, addressing access to information as well as roles/responsibilities of different stakeholders, government responsiveness and transparency of funds for sanitation and hygiene promotion. Practitioners formed sub-groups, which will take each subject forward. Arrangements were also made for cooperation in advocacy work on sanitation and hygiene in the South Asian region.

Assessing and enhancing cost-effective promotion and delivery

Promising programmes are currently carried out to make whole districts and cities in South Asia open-defecation free. At the same time, no good field studies could be found that assess the effectiveness and the full costs (i.e. to agencies, communities and households) of these programmes. It is therefore proposed that a group of participating partners will together design and implement an evaluation or action research project to do an ex-post evaluation of some district or city-wide sanitation campaigns. Alternatively, the

⁹ The government estimate is based on the household latrine coverage and distribution of sanitation subsidies. However, the definition of sanitation as well as reliability of the coverage are issues that are now being addressed by the government through an independent committee set up recently. Source: Muhammad Abdus Sabur and Dr Syed Ishteaque Ali Jinnah (WaterAid), Challenges in our sanitation sector, Daily Star, 19 Nov 2007, <http://www.thedailystar.net/story.php?nid=12146>

measurement of costs and behavioural effects could be included in an action programme to make a district or city open defecation free.

For research, each partner would investigate the approach, costs and effectiveness to achieve freedom from open defecation in, say, one rural district or one municipality with the help of a common research design. The districts or municipalities would be representative for the situation in at least a large part of the country or state(s) concerned. Investigations would focus on the resources, costs and results of the approaches and include as many of the issues identified in the workshop as important for effectiveness, sustainability and equity of improved sanitation.

Validating claimed successes

Experiences in parts of India (e.g. Midinapure, Maharashtra) and Bangladesh (CLTS) show that with effective promotion, community-managed action and easy access to low-cost designs and material, almost all households will build improved toilets without direct subsidy. Yet independent evaluations of the approaches are extremely scarce. Despite its early success, no evaluation could be found of patterns of use and upkeep of the Midinapure toilets. The same goes for claims that the CLTS approach has made whole districts open defecation-free. Evaluation of two ODF-districts in Maharashtra by AFPRO showed incorrect claims in 10% of the village in one district and 57% in the second (Jain, 2007).

Making exaggerated claims about the success of programmes, and seeking to promote approaches as being the (single) way forward, actually do a disservice to the people that these programmes

are aiming to serve. Independently-led, participatory evaluations would be very useful to learn if and why large programmes have been successful in some areas more than others. Workshop participants from areas with such programmes might get together to work out an agreed methodology and proposal for the rapid assessment of such alleged successes, preferably in a learning approach with the actors.

The participants identified the development of common indicators to provide sound evidence for attributing development impacts of sanitation and hygiene programmes (e.g. on health, education, livelihoods, empowerment etc.) as a key aspect to better measure outcomes and impacts of sanitation and hygiene programmes. Stress was placed on including safe disposal of children's faeces as an important indicator of programme effectiveness.

Assessing safe end-disposal of excreta and possible alternatives

A last neglected subject area requiring more data and insight is what happens to human excreta from toilets that are filled up and what alternatives are used for safe disposal. In the South Asian region, millions of improved household toilets have been built with either a single or a double pit. Very little is known about what happens when these toilets are full: who empties them (if at all), at which costs and what is done with the raw and composted excreta. Especially in densely populated areas, fewer and fewer households will have the possibility to construct a new toilet and cover over the full pit. In due course they may use the excreta productively by planting a timber or fruit

tree in that spot. Hygienic and safe emptying and end-disposal of excreta becomes extremely important.

This review has taught that cash costs of pit emptying and end-disposal of excreta are not included in the costing of domestic toilets. Yet these costs can be higher than those of the toilet itself (Allan, 2003). Nor could any information be traced on safe and socially acceptable pit emptying and end-disposal programmes, except some information that because of the greater demand, sweepers can earn more even at a unit cost reduced from Tk 200 (US \$3.64) to Tk 100. One sweeper, who covers three to four villages in Chittagong district by bicycle and earns more than US \$260 per month, plans to buy a mobile phone so that customers can reach him more easily (PAC, 2006). A project in Mirzapur trained 12 women to empty pits, paying the then local unskilled wage rate of T 60 (then US \$2) per day. A team of three took three to four hours per pit, at a unit cost of then T 120. This was far less than the T 1,000 of professional sweepers from the local hospital (Aziz et al, 1990). However, no data on sustainability are available.

Mechanically filled vacuum tanks, which put an end to manual pit emptying and can be used more easily in areas that are difficult to reach, are now used in a few low-income urban areas including in Dhaka (Scott and Reed, 2006). The NGO Shubashati is testing it for UN-Habitat in Kushtia Municipality. The Gulper, a handpump to empty latrines, is under

testing in Cambodia. Socially more acceptable and economically profitable ways of pit-emptying and disposal are an important development area in urban sanitation. The cost-effectiveness of such ways should be compared with alternative ways of disposal that do not require sludge collection and disposal, such as dry toilets and community-managed mini-sewerage systems with onsite treatment of black and grey water ¹⁰.

The workshop participants identified the following specific sub-topics for action research on safe end-disposal: (a) costs of the urban sanitation chain, (b) modification of septic tanks for 'self-treatment', (c) faecal sludge management, composting and biogas options, (d) cost-benefits of eco-sanitation (e) public-private partnerships on motorised pit emptying with safe end-disposal, and (f) safety guidelines for low-tech manual pit emptying.

Citizens voices and accountability for actions

As a final topic, the participants identified citizen demands and responsiveness to these demands as key areas for action research. Sub-topics identified were how and to what extent do different citizen groups get access to information, the roles and responsibilities of different stakeholders on providing effective sanitation and hygiene promotion services, responsiveness of the government and other stakeholders to citizen demands, and transparency on the use of funds for sanitation and hygiene promotion.

¹⁰ The system consist of a number of paid house connections shared by one or more families from which the sewage flows via individual manholes to an series of baffle reactors (a kind of inter-connected septic tanks). The solids of the sullage sediment in these tanks, while the increasingly clear blackwater moves from tank to tank to drain ultimately into a field or the local drainage system. The tanks are preceded by a grease trap to catch the grease from e.g. the disposal of cooking oil. A community-employed operator cleans the grease trap and deals with any blockages.

Enhancing institutional and human capacity for scaling up cost-effective sanitation

Going to scale on demand responsive sanitation and hygiene is not possible without supportive organisations and staff with the right mix of skills, attitudes and management systems. This review indicates that especially government agencies at the intermediate (district) level lack the required human and organisational capabilities. It would therefore be very useful to undertake more actions and do more research in these specific subject areas.

More actions should focus especially on better training and management of participatory promotion of improved sanitation and hygiene at the supportive level(s). Judging from the problems with scaling up CLTS/TSC with quality, there is a dire need for short, low-cost and field-tested capacity building and support programmes for participatory sanitation and hygiene promotion based on the methods and techniques already in use in the region, in particular PRA and PHAST.

New research might focus especially on *with whom* and *how* to scale up (quickly), but with effective HRD. Regarding the *with whom*, there are as far as could be found no investigations of the socio-psychological and socio-organisational factors which distinguish successful sanitation promoters and business(wo)men from their less successful colleagues. The same goes for the *howto* of capacity building. Can programmes select government workers for personal qualities, develop the right types of attitudes and skills and sustained them effectively on a large scale and in a short time, or will that kind of staff and staff capacity only flourish in relatively small NGO programmes?

Surprisingly, actions for and research on building and using support capacity on community sanitation and hygiene improvements at the intermediate level did *not* emerge as a priority area. It may be that for this subject to emerge as a subject in its own right needs more documentation, exchange of experiences and attention as part of research of field programmes.

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