

ON-PLOT SANITATION

IN LOW-INCOME URBAN COMMUNITIES

Guidelines for Selection

ON-PLOT SANITATION

IN LOW-INCOME URBAN COMMUNITIES

Guidelines for selection

Andrew Cotton and Darren Saywell

Water, Engineering and Development Centre
Loughborough University
1998

© Water, Engineering and Development Centre
Loughborough University 1998

ISBN Paperback 0 906055 55 5

This document is an output from a project funded by the UK
Department for International Development (DFID)
for the benefit of developing countries.
The views expressed are not necessarily those of DFID.

Layout by Karen Betts
Designed by Rod Shaw

Contents

Part 1

A	Background	3
B	Guidance points in relation to latrine types	7
C	Guidelines for key questions	21
D	Cross-cutting issues	31
E	Conclusions	55

Part 2

A	Supporting evidence	59
B	Sample characteristics (by technology)	107
C	Database listing	111
D	Bibliography	113
E	Annex	139

Tables

1	User perceptions of simple pit latrine costs for facilities built in 1995 and 1996, Mozambique	37
2	Incidence of technology type against plot size category	82
3	Plot size calculations for selected technology types	83
4	Comparison between minimum plot sizes laid down in planning regulation and average plot sizes in informally developed urban districts	84
5	User perception of incidence of odour nuisance by latrine type	85
6	Incidence of insect nuisance by latrine type	87
7	Rank order of main household source of income, by technology type	89
8	Levels of expressed user satisfaction by technology type	92
9	Most commonly noted problems with toilet by technology type	92

10	Crosstabulations between recorded problems and user satisfaction	93
11	Crosstabulations between recorded problems and perceived impact on use of latrine	94
12	Comparison of latrine types and emptying method	96
13	Responsibility for emptying by latrine type	97
14	Breakdown of number of years in use recorded as ‘not emptied’ (selected years: 1-10; excluding bucket/pan latrine)	97
15	Breakdown of years latrines used by number of times emptied (excluding bucket/pan latrines)	98
16	Breakdown of re-emptying period by latrine type (excluding bucket/pan latrines)	98
17	Type of emptying problem by latrine type	99

Figures

1	A simple improved pit latrine	7
2	Unreinforced domed slab	8
3	Ventilated improved pit latrine	8
4	Pour flush latrine with pit beneath the superstructure	9
5	Septic tank	10

Case studies

1	Pit emptying of pour-flush latrines	15
2	Bucket/pan latrine use	19
3	Absence of household latrine: 1	22
4	Absence of household latrine: 2	23
5	Source of insect nuisance on-plot	25
6	Influence of belief systems on siting of household latrines	33
7	Impact of ‘high cost’ KVIP’s in Ghana	37
8	Experiences of cost recovery and one NGO’s response	40
9	Institutional responsibilities under the SSP, Kumasi, Ghana	42
10	Urban sanitation improvement team, Ghana	43
11	Domestic sanitation programme, Kumasi, Ghana	49
12	Programme promotion in Maputo, Mozambique	50
13	Strategic sanitation plan, Ouadadougou, Burkina Faso	51
14	Example of unsupported initiative for sanitation provision	90

Field insight

1	Experiences with pour-flush pit latrines	16
2	Emptying pour-flush latrines by scavengers	28
3	Institutional framework to National Low Cost Sanitation Programme (PNSBC), Mozambique	44

Photographs

1	Typical latrine superstructure (made from reeds) used in Mozambique, where it is customary for latrine shelters to be built without a roof	61
2	Transportation of completed slabs from production unit to household plot, Maputo, Mozambique	61
3	Production of popular unreinforced domed slabs used for low cost simple pit latrines in peri-urban areas of Mozambique	62
4	Pour flush latrine in improved urban slum, Vijayawada, India Operational sanitation facilities were found to be commonplace on the smallest of plot sizes (as small as 14m ²)	63

Glossary

Aqua privies

Latrine in which excreta fall directly through a submerged pipe into a watertight settling chamber below the floor, and from which effluent overflows to a soakaway or drain.

Arithmetic mean

The sum of the values of all observations divided by the number of observations.

BOD

Biochemical oxygen demand: the mass of oxygen consumed by organic matter during aerobic decomposition under standard conditions, usually measured in milligrams per litre during five days; a measure of the concentration of sewage.

Excreta

Faeces and urine.

Compost latrine

In this type of latrine, excreta fall into a watertight tank to which ash or vegetable matter is added.

Dry latrine

A latrine where users defecate into a bucket, basket or other receptacle that is regularly emptied. This type of latrine forms part of the nightsoil system.

Latrine

Place or building, not normally within a house or other building, for deposition, retention and sometimes decomposition of excreta.

Overhung latrine

Latrine sited such that excreta falls directly into the sea or other body of water.

Median

The value above which and below which half of the cases fall, the 50th percentile.

Mode

The most frequently occurring value (or values).

Nightsoil

Human excreta, with or without anal cleaning material, which are deposited in a bucket or other receptacle for manual removal (often taking place at night).

Off-set pit

Pit that is partially or wholly displaced from its superstructure.

On-plot sanitation

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

On-site sanitation

Includes communal facilities which are self-contained within the site, in contrast to sewerage and dry latrines where excreta is removed from the site.

Pathogens

Organism that causes disease.

Percolation rate

The rate at which liquids move through soil.

Pit latrine

Latrine with a pit for accumulation and decomposition of excreta and from which liquid infiltrates into the surrounding soil.

Pour-flush latrine

Latrine with a small quantity of water is poured in to flush excreta through a water seal into a pit.

Sanitation

The means of collecting and disposing of excreta and community liquid waste in a hygienic way so as not to endanger the health of individuals or the community as a whole.

Septic tanks

Watertight chamber for the retention, partial treatment, and discharge for further treatment, of sewage.

Sewage

Wastewater that usually includes excreta and that is, will be, or has been carried in a sewer.

Sewer

Pipe or conduit through which sewage is carried.

Sewerage

System of interconnected sewers.

Soakaway

Soakpit or drainage trench for subsoil dispersion of liquid waste.

Soakpits

Hole dug in the ground serving as a soakaway.

Sullage

Wastewater from bathing, laundry, preparation of food, cooking and other personal and domestic activities that does not contain excreta.

Superstructure

Screen or building of a latrine above the floor that provides privacy and protection for users.

TACH

Total annual cost per household; includes capital (or investment) costs and recurrent costs.

Vent pipe

Pipe provided to facilitate the escape of gases from a latrine or septic tank.

VIP latrine

Ventilated improved pit latrine, pit latrine with a screened vent pipe and a partially dark interior to the superstructure.

Water seal

Water held in a U-shaped pipe or hemispherical bowl connecting a pan to a pipe, channel or pit to prevent the escape of gases and insects from the sewer or pit.

Wastewater

Sewage or sullage.

Y-junction

Chamber in which liquid may be directed along either of two pipes or channels.