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AQUA PRIVY SEWERAGE SYSTEMS
a survey of some schemes in Zambia

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1.0. Introduction

1.1. Sanitation in developing countries

The greatest challenge for the people concerned with environmental health in developing countries is that of water supply and excreta disposal systems in high density, low-income urban communities. Recent statistics show that only a minor part of the population lives in houses connected to waterborne sewerage.

Sanitary disposal methods in Zambia (figures in percentages)

	URBAN CENTRES			LUSAKA		
	1969 (1)	1974(2)	1976(3)	1969(1)	1974(2)	1976 (3)
Flush toilets	56,7	46.2	43,9	42,3	39,4	37,3
Aqua privy	7,0	5,4	5,5	2,9	1,4	1,2
Pit latrine	26,7	37,7	40,1	46,1	52,1	53,7
Bucket	2,1	1,5	1,3	6,5	3,1	2,7
None	7,5	9,2	9,2	2,2	4,0	4,7
	100%	100%	100%	100%	100%	100%

These figures demonstrate the fact that whatever the official policy is, the proportion of dwellings with full services is rapidly declining. Therefore, it seems that even when the official policy is to provide full services for every individual dwelling; in practice only a small proportion of new dwellings will enjoy these facilities.

The occupants of low income housing estates have often a rudimentary or totally absent health education, and sometimes these people have little comprehension of the reason for sanitary precautions. Therefore, they do not have health protective habits for urban living.

Consequently, the sanitary systems must provide security against the possibility of ill-health as a result from mismanagement or misuse of the system. An efficient sanitary system does not necessarily mean a sophisticated system. The provision of a sanitary system beyond the technological competence of the community could be a waste of money and effort.

Mechanical flushing systems (which require attention to the waterlevel mechanism), U traps in toilets (which become blocked where toilet paper is not common), and U traps in washing sinks (where sand and porridge cause blockages), can ruin the conventional waterborne system.

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1. CSO Census of population and housing 1969
2. J.T. Robertson "The urban situation Shelter" 1974.
3. Estimate made by Ministry of local Government and Housing. Figures are not strictly comparable due to boundary changes in Lusaka and in urban areas.

We also must not forget the environmental hazards involved and the increased water consumption for a toilet system. In a low income housing estate the user converts daily around 40 litres of clean drinking water, about 50% of his total consumption, into pathogenic matter which even in an expensive treatment cycle cannot be completely sterilized.

This deterioration of the existing situation can be prevented or minimized only by the introduction of an "appropriate intermediate" solution, which can be afforded both by the nation and by householders and which can be provided at a rate consistent with that of urban growth.

The aqua-privy sewerage can be one of the solutions in this field.

The following literature mentions the Zambian solution:

Disposal of community waste water	WHO Technical Report No.541
Rural sanitation in the tropics	The Ross Institute
Waste Stabilization Ponds	WHO publication Gloyna
Sewage Treatment in hot climates	D. Mara
Stop the Faeceal Peril	IDRC report
Water Waste and Health in hot climates by	Feachem, M. Mc Garry and D. Mara
A system of sanitation for low-cost high density housing by	L.J. Vincent, W.E. Algie and G. Marais.

1.2. Objectives of the visit

The objectives of the visit were to gather information about this aqua-privy system.

It is of great interest to know the performance of these installed schemes, not only in technical performance, but also in long term social acceptability by the local population. For this reason an investigational visit has been made to Zambia during the first weeks of January 1978 to obtain this information.

The report "A system of Sanitation for low-cost high density Housing" mentions that self topping aqua privies had been installed in nine local authority townships plus several small settlements in Zambia. However, the author experienced great difficulty in locating these particular townships, because centrally no information could be obtained. Most of the schemes were built in the late fifties and early sixties.

Remarkably few investigations has been made into these type of schemes in Zambia. Apparently, the bulk of the information about these schemes is found outside Zambia. There was no other choice than to visit every township individually and to look for these

particular schemes. Unfortunately only a limited number of townships were visited on this occassion, and due to lack of funds the author had to cut his visit short.

In Zambia the following authorities were contacted:-

National Housing Authority

Anglo American Mining Company.

Lusaka City Council

Kabwe City Council

Ndola City Council

Kitwe City Council

According to conversations held with Mr. Kabwe, the housing manager of the Anglo American Mining Company, they do not operate housing estates with aqua-privy-sewerage systems.

The City Engineers of Kitwe, W.T. Simmons and J. Mitchell Mc. Coy, related that at present no council housing estates exist with the aqua-privy-sewerage system.

1.3. Aqua privies on individual soakaways

For some years, Zambia had aqua privies in low-income housing estates installed. At first aqua privies were installed with individual soakaways and a piped water connection in the vicinity of the plot. The user had to carry the water to the aqua privy to maintain the water-seal around the chute pipe. This continues to avoid flies breeding and to prevent odours escaping out of the tank. The units, where the user has to bring water to the aqua privy, are regarded as a failure. It was socially unacceptable for the user to be seen carrying water to the toilets. The habit of not adding water to the tank converted the aqua privy into an open pit with all the disadvantages. To overcome this problem, the Councils have started "topping up squads" to fill the tanks with two buckets of water daily. This procedure failed also by lack of adequate supervision.

Discharge of non-decomposable materials into the tanks has seriously reduced the life span of the tank and hence emptying intervals. Failure on the part of the councils to provide regular inspection visits and emptying facilities has had a negative influence on the system.