

IDRC — 168e

# Sanitation

in Developing Countries

**ARCHIV** Reports of a workshop on  
**45805** held in Lobatse, Botswana,  
17-21 August 1980

The International Development Research Centre is a public corporation created by the Parliament of Canada in 1970 to support research designed to adapt science and technology to the needs of developing countries. The Centre's activity is concentrated in five sectors: agriculture, food and nutrition sciences; health sciences; information sciences; social sciences; and communications. IDRC is financed solely by the Parliament of Canada; its policies, however, are set by an international Board of Governors. The Centre's headquarters are in Ottawa, Canada. Regional offices are located in Africa, Asia, Latin America, and the Middle East.

©1981 International Development Research Centre  
Postal Address: Box 8500, Ottawa, Canada K1G 3H9  
Head Office: 60 Queen Street, Ottawa

IDRC, Ottawa CA

IDRC-168e

Sanitation in developing countries : proceedings of a workshop on training held in Lobatse, Botswana, 14-20 August 1980. Ottawa, Ont., IDRC, 1981. 172 p. : ill.

/IDRC publication/,/sanitation/,/waste waters/,/waste disposal/,  
/appropriate technology/,/health education/,/Africa/ — /sanitation  
services/,/waste treatment/,/methane/,/disease transmission/,/water  
supply/,/water pollution/,/health services/,/auxiliary health workers/,  
/civil engineering/,/vocational training/,/resistance to change/,/financial  
aspects/.

UDC: 628.2/.6(6)

ISBN: 0-88936-293-9

Microfiche edition available

**IDRC-168e**

# **Sanitation in Developing Countries**

**Proceedings of a workshop on training held in Lobatse,  
Botswana, 14-20 August 1980**



*Sponsored by:*  
*Government of The Republic of Botswana*  
*International Development Research Centre*  
*Canadian International Development Agency*

ARCHIV  
628.4(6)  
S 2

## Contents

**Foreword 6**

**Participants 7**

**Technology**

Use of dry pit latrines in rural and urban Ethiopia  
**K. Kinde 9**

Pit latrines in Botswana  
**J.G. Wilson 13**

Pit latrines in Malawi  
**A.W.C. Munyimbili 16**

Housing sanitation, Mozambique  
**B. Brandberg and M. Jeremias 21**

The PIP and REC II latrines  
**J.G. Wilson 24**

On-site excreta disposal technologies  
**E.K. Simbeye 27**

Anaerobic digestion as a rural sanitation option  
**R. Carothers 34**

Zambia's experience with aqua privies  
**J. Kaoma 41**

The Botswana aqua privy  
**J.G. Wilson 48**

Septic tanks  
**Beyene Wolde-Gabriel 50**

Sanitary situation in Addis Ababa  
**Aragaw Truneh 52**

Sewerage and low-cost sanitation: a solution to sanitation problems in  
developing countries  
**Frederick Z. Njau 56**

Sullage disposal in urban centres  
**Frederick Z. Njau 59**

Technology: discussion **61**

## **Software**

- Disease transmission  
**G.P. Malikebu 64**
- Sanitation and disease transmission  
**J.B. Sibiya 68**
- Water pollution and sanitation in Botswana  
**L.V. Brynolf 71**
- Primary school health education in Tanzania  
**I.A. Mnzava 75**
- Health education in primary schools in Malawi  
**I.K. Medi 79**
- Health education delivery system in environmental health programs  
in Malawi  
**Winson G. Bomba 81**
- Rural health services in Ethiopia  
**Araya Demissie 84**
- Health education, an essential component in the promotion of health,  
with emphasis on rural sanitation  
**Saidi H.D. Chizenga 88**
- Water supply and sanitation in Lesotho  
**M.E. Petlane 94**
- The role of health education in sanitation programs  
**Winson G. Bomba 101**
- Some sociological aspects of sanitation provision (with particular reference  
to Botswana)  
**Nomtuse Mbere 105**
- Problems of acceptability of low-cost sanitation programs  
**P.M. Matiting 111**
- Community/household participation  
**A.W.C. Munyimbili 113**
- Applied community participation in sanitation provision  
**Nomtuse Mbere 118**
- Financial aspects of sanitation  
**Dawit Getachew 123**
- Financing of low-cost sanitation schemes in the urban areas of Botswana  
**Brian Bellard 131**
- Training implications within the sanitation sector in Tanzania  
**H.W. Rutachunzibwa 135**
- Health manpower planning and training  
**P.A. Chindamba 139**
- Software: discussion **143**

## **Training**

Training of civil engineers in Kenya

**J. Gecaga 148**

Sanitary engineering education in the Faculty of Technology, Addis Ababa University

**Alemayehu Teferra 152**

The training of health inspectors in Malawi

**P.A. Chindamba 153**

Training of health assistants in Malawi

**G.P. Malikebu 155**

Training of primary health care workers: a personal account

**Fred K. Bangula 157**

Brigades in Botswana 161

Botswana Polytechnic and its involvement in the teaching of sanitation

**J.E. Attew 163**

Ethiopian sanitation sector institutional responsibility

**Beyene Wolde-Gabriel 165**

Training: discussion 166

**Workshop Conclusions 167**

# **Some Sociological Aspects of Sanitation Provision (with Particular Reference to Botswana)**

**Nomtuse Mbere<sup>1</sup>**

## **The Disease Pattern**

Compared with other developing countries, Botswana is a relatively healthy country. This is shown by: (1) a mortality of 137 per 1000, largely due to a low infant mortality of 103 per 1000 male and 91 per 1000 female births; (2) low worm infestation in excreta; (3) tropical diseases such as malaria are confined to the swampy areas of the north, tsetse flies are also found in this area; (4) bilharzia has been a problem for some time though not as serious as in some other countries; and (5) tuberculosis is a major health problem together with other respiratory diseases such as pneumonia, gastroenteritis, measles in children, and venereal diseases. The disease pattern is changing due to modernization and there will soon be obvious trends between urban and rural disease patterns; nonetheless, in the urban areas the incidence of the diseases of civilization is still very low.

## **Nutritional State**

Compared with other countries, the nutritional state of Botswana is still relatively good, even though Botswana is not endowed with naturally growing goods like matoke in Central Africa and plantain or yam in West Africa. Diseases from malnutrition, such as kwashiorkor and marasmus,

are very rare but there is chronic malnourishment due to an unbalanced diet. The nutritional state is also affected by the scarcity of rain or the fact that the rains are usually late, so in the end, the lower classes and rural masses, at times, depend upon food programs and the enriched powdered milk donated by some Canadian organizations; the latter being distributed by the Social Welfare Department. The droughts contribute to the fact that the nutritional state is never high.

All of these characteristics have a bearing on sanitation provision. Botswana is clearly divided into upper/middle and lower classes. The former are provided with water-borne sewerage, whereas for the latter, what are termed as cheap and socially acceptable sanitation facilities have to be found. The Government of Botswana is presently trying to bridge this gap.

If sanitation provision is to be acceptable, then one has to look at the social factors involved. These factors can be divided into external and internal factors (Jackson 1978). External factors are those exogenous to the particular community, e.g., lack or presence of government support. Internal factors are those affecting the acceptability of facilities.

## **External Factors**

These can be due to the larger social system and some people may not understand what role they have in the discussion of the social aspects of sanitation. It is the

---

<sup>1</sup>Sociologist, Ministry of Local Government and Lands, Gaborone, Botswana.

author's contention, however, that if these external factors were ideal, then there would be minimal problems at the internal factors' level. Therefore, an examination of these factors is necessary. These external factors include the power structure, social stratification, and economic forces; the latter may be influenced by natural resources, investment, or foreign aid, resulting in limited or abundant national economic resources. Inept and inadequate planning and management, insufficient involvement on the part of the government, and a shortage of trained manpower further exacerbate problems with these external factors.

These factors are at a national or state level and governments approach them differently, but most of these factors must be overcome, if negative, before improvements in facilities can be implemented. The government must also make it its policy to improve facilities either from a health improvement standpoint, thereby attacking the lack of water and sanitation facilities and improving nutrition, or as a general policy of, for instance, urban development, where adequate housing and environmental sanitation form the basis of the policy.

There are, of course, other factors outside of these factors, e.g., the bureaucracy attached to foreign aid and the unattainable World Health Organization (WHO) resolution of "health for all by the year 2000," or the similarly unattainable United Nations declaration "The International Drinking Water Supply and Sanitation Decade (1981-1990)." As a result of these resolutions, international activity is widespread in these fields and as Feachem (1980) states, resolutions like this "provide a major international opportunity for progress...but it also brings with it a major risk. It focusses the spotlight upon one aspect of development and will mobilize substantial investment in drinking and sanitation programmes only." If, however, such international efforts result in convincing policy makers that adequate water and sanitation facilities rank high in importance, then the problems associated with planning, assigning priorities, and securing financial assistance can be pursued.

Some of these problems cannot be overcome immediately, e.g., the shortage of trained manpower, which can result in poor designs and inadequate operation and management, but an effort toward providing properly trained personnel needs to be a priority. These are a few of the external factors, some of which are universal, that need to be examined as well in an effort directed at the provision of sanitation facilities.

## Internal Factors

Internal factors directly affect the populations to be served. Efforts directed at social acceptability of the facilities have to take into account the individual's personal values and habits, the individual's own experiences, and the meaning attached to both of these. The inquiry must be aware that behaviour at the interpersonal level is guided by others, who, through networks of influence, define the socially acceptable and preferred behaviour. Thus, identification of such networks, whose influence and response will determine, in part, the users response, is essential. This can be achieved through different techniques.

The social factors that affect individuals may be:

(1) Poverty: The target population may be too poor to provide the latrines themselves.

(2) Education: The developing countries are characterized by a high rate of illiteracy and semi-illiteracy. The consequence is that sometimes people do not know how to use the facilities properly or may not even comprehend the relationship between an unsanitary environment or poor nutrition, and poor health. Latrines require frequent cleaning and maintenance, but people may not be aware of these requirements or how to meet them.

(3) Tradition and culture: Years of tradition and ingrained cultural practices may make it impossible to accept innovations.

(4) Physical environment: The quality of the physical environment of the users, including such factors as housing, transportation, refuse collection, and water

provision, will affect the acceptability of latrines.

These internal factors have to be considered before a project on sanitation provision is embarked upon. To what extent, then, were these social factors relevant to the Botswana project?

Firstly, Botswana is a dry country with a very low population density, so that provision of sanitation facilities was not necessarily a priority in the past. It was only with the rapid development of urban areas and a completely negative social acceptability of fibreglass aqua privies that the government decided to begin a low-cost sanitation project. In 1976, the government, together with the International Development Research Centre (IDRC), undertook an investigation into alternative forms of low-cost sanitation. This was done by testing improved pit latrines, Reed odourless earth closets (ROEC), type B's, and various composting latrines. The Ministry of Local Government and Lands (MLGL) is responsible for urban and rural developments and for developing sanitation as part of the new infrastructure. Therefore, it was logical to have the project based in this ministry.

A sociological survey was undertaken in all four urban areas to answer questions related to demography; epidemiology of what were perceived to be sanitation-related diseases; the physical environment of potential users, including distance to water facilities; refuse disposal; types of housing; and financial status of respondents. This was done using a sample survey with a structured questionnaire. Through informal interviews and in-depth discussions with potential users and other administrative personnel, questions on religious groups and their behaviour regarding sanitation, contributions of social welfare agencies, belief systems, and the influence of social networks were asked. Some replies were elicited.

The project personnel were semimulti-disciplinary in that there were two engineers, one health assistant, and one sociologist. As a result, a technical survey of existing sanitation provision was also undertaken by one of the engineers and the health assistant.

Samples of soil, urine, and excreta were obtained and analyzed. There were also fact-finding trips outside of Botswana. As a result of the information collected, prototypes were built and monitored. As a result of data from this monitoring period, four experimental units were selected, built in larger numbers, and monitored on a longer basis.

## Social Acceptability

There was the belief in the national model (Tonon 1978), in which the assumption is made that information directed to the selected population would produce changes in the knowledge level that would, in turn, influence daily practices and behaviour. The fact that users used the toilets would suggest that this assumption was correct, but the fact that children still do not use the facilities, men still urinate against the toilet walls, and some toilets were only maintained because of weekly monitoring, indicates that the assumption was wrong. One could argue that this was due to a lack of health education. To some extent this is true, but the logic that man acts in his own self-interest is at times not correct, otherwise, for instance, the people who know the health hazards associated with smoking and overeating would have abandoned these habits long ago. It doesn't necessarily follow, therefore, that knowledge results in correct behaviour. Under what circumstances, then, can information lead to behavioural change?

Most workers in African countries feel that if there is a felt need, then it follows that there will be a smooth behavioural change; but what such advocates forget is that the need may not be apparent to the individual who is ignorant, or even if the need is there the individual may lack the information or resources to achieve the goal. At present, some governments, perceiving that their populations are not aware of such needs, have decided unilaterally to supply the facilities needed. Some of these efforts are disastrous: the facilities are left unused, vandalized, or completely rejected. In these situations another approach can be tried where extension workers are, for instance,

used to demonstrate how a pit latrine is built, where to buy the building equipment, and what the costs are. The other approach presents the information in a socially acceptable manner, having taken cognizance of beliefs and customs. The initial sociological survey was taken with this last approach in mind and the data collected were used to design what would be socially acceptable latrines. The explanation that the units were experimental and were to help government choose what was acceptable to the people were effective. As a result, even units that were unknown could be tested, e.g., composting toilets, because the users knew that the decision to use them or not was theirs and that they could uproot them and build latrines of their choice if they so desired.

Another approach uses an educative model, which most vaccination campaigns use, but is more appropriate in rehousing or resettlement programs, where the behaviour to be changed is an integral part of the cultural system. Programs using this approach must realize the need to take cognizance of the motivation of those to be affected, i.e., the need for local involvement in the planning process and in the design of the program. The low-cost sanitation project wasn't of such magnitude or even at that level. The users were not required to help in any way and no contributions of costs or labour were elicited, so that the only motivation on the part of the potential users was their felt need to have a toilet and the motivation to cooperate with the researchers during the monitoring phase. One would expect that with such low motivation there would have been less support, but the results show that the project did get the necessary support from the users and it was, therefore, recognized that motivation is not always intrinsic to all human behaviour.

The centralization at government level was diffused by having an interim committee consisting of personnel involved in all aspects of sanitation; health personnel; council personnel; personnel from the Botswana Housing Corporation (BHC), a parastatal body; from water affairs; and from the works department. All of these

people had a say in the ongoing project and in the final recommendations.

At a lower level in the hierarchy, ward councillors, together with the users, were invited to seminars where they were shown how the different latrines functioned and were asked to suggest areas where some of the experimental units could be built.

## **Problems in the Botswana Project**

(1) If people are poor, then it is evident that the problem is in the social structure of the country. In this project, those people who could not afford cleaning materials for regular latrine maintenance were allotted brushes with long handles for cleaning the ROEC chutes. There is, of course, a danger of creating a dependency upon handouts among the poorer people, which the project personnel were well aware of, but the success of the project at times becomes the overriding criteria.

(2) A multidisciplinary team approach is usually very effective, even though technical people, such as engineers, may find it difficult to understand people from other disciplines. This project should have included personnel from the Health Education Unit, Department of Water Affairs, Adult Education Institute (for informal education), brigades for intermediate technology extension workers, and family welfare educators. In addition, some participation from the users themselves would have been of value.

(3) (a) Exposure of the potential population to the surrounding environment is also important. In the Botswana experience, exposure to developed South Africa and Zimbabwe influences the expectations of the people. As a result, expectations are very high in this region. This is indicated by the fact that in the initial sociological survey 100% of the respondents had the flush toilet as their first choice. With this in mind, the type B was designed and socially it is still highly acceptable, though there are people who do not like carrying the water for flushing. Whether technically, i.e., its high requirement of constant maintenance, and economically, i.e., very expensive, it is the

best toilet is a moot point if government is committed to an acceptable and hygienic toilet. (b) Communal toilets were rejected because of the fact that they are always misused, they do not provide enough privacy, and even the idea of sharing was not acceptable. (c) Building materials: all respondents preferred a concrete super-structure and sitting as opposed to squatting.

(4) Due to the semi-illiterate state of the potential users, it was inevitable that the social distance between users and project personnel would be large. Because educational strategies require intimate knowledge of the culture if they are to effect behavioural changes, not only through the cognitive structures but also through changes in experiences, values, roles, and interpersonal relations, it is necessary that the social distance between project personnel and users be small. It is, therefore, discouraging that certain governments are so committed to production of education certificates that their own experienced local workers, who understand the population because they are part of it, are excluded from training programs because they lack such certificates. If governments commit themselves to paraprofessionals who can be frequently exposed to seminars, workshops, and short upgrading courses, it would be easy to transfer some of their resources toward training a few highly skilled personnel. There is a lot to be said for a local engineer compared with an expatriate engineer because even though academically the approach might be similar, culturally they will remain different. This is not to advocate abandonment of highly skilled manpower, but the immediate problems in Africa, in general, may not need as many of these workers. The family welfare educator program, health assistant program, and some of the social welfare and extension worker programs are a step in the correct direction in Botswana.

(5) Maintenance: If maintenance, e.g., emptying the sludge or humus, threatens social acceptability, then some other agency must be approached to undertake such procedures even though this might add to maintenance costs. Therefore, because all compost toilets in this project would have

been socially unacceptable if users had to empty them, councils were approached to undertake this task. This does not mean that there were no other features of compost toilets that were not acceptable but with a high health education input these can easily be overcome; even if there are design and high groundwater table problems.

(6) Privacy: In most African societies, defecation is not a social occasion, even though a few women could be seen to leave in the early morning or late afternoon for a defecation site. The defecation process is private. The idea of carrying water to flush the aqua privies challenged this norm, resulting in the complete rejection of this toilet type. This problem was solved through the provision of a washtrough to enable the toilet to be flushed from outside, or even using the water used for washing dirty clothes in the trough. This had an added value of making sure that the water was kept at the correct level.

Privacy in some countries may be exaggerated because of cultural taboos, e.g., the father-in-law - daughter-in-law avoidance taboo. The prevalence of such taboos in urban areas is likely to be minimal. Communal and public latrines also act against the need for privacy. If these latrines are continuously maintained, however, and there is no alternative provided due to a lack of financial resources or scarcity of land as in Asia, then these can be used. In Botswana, it would take a lot of persuasion and convincing for the people who could not afford their own latrine to use communal latrines. There are some old communal toilets in Bluetown in Francistown, but recently, the government hasn't constructed any except in schools, clinics, and refugee camps.

## Conclusions

Social acceptability is a concept that is suddenly in vogue simply because some earlier technical innovations that excluded it were a failure. This trend is to be welcomed because social and cultural beliefs and behaviours must be taken into consideration. If this approach is to be successful, a

multidisciplinary team in which contributions by individual members are accepted, debated, and finally incorporated into recommendations is a must, but if one discipline plays a dominating role, this will not auger well in the overall approach.

As much as social acceptability is concerned with knowing and understanding peoples' cultures and behaviours, it shouldn't be used by adherents of the traditional anthropological approach to revive their attempt to classify the so-called "primitive" peoples according to their different defecation habits.

Social acceptability is influenced both by external and internal factors. While not all external factors can be overcome, an effort toward remedies could have a positive impact on the internal factors. Education, as implicit throughout this paper, is likely to play a major role and should be directed at primary and high school children, supported by informal education for adults who are illiterate. This would help change some of the entrenched behavioural patterns.

Although this paper has not discussed rural areas, much of Africa is rural and these are the areas where most health education efforts need to concentrate.

Because there are few sociologists working in this field, it becomes necessary for them to coordinate their efforts, share experiences, and exchange information; for though there are minor cultural differences (in Africa), on the whole, these studies are relevant to other areas and countries. It will also be necessary for the sociologists to determine what the variables of social

acceptability are, and to take cognizance of their respondents' thoughts on social acceptability. We must not impose our views upon people; the process must be an exchange, only then can we avoid alienating the populations we are learning from.

If the teams are multidisciplinary, a stage could also be reached where not every survey will have to ask the same questions over and over. This would result in an ideal atmosphere where respondents are not tired and bored with the surveys. Similarly, experience has revealed that structured questionnaires do not provide all the necessary details. There is a lot to be said for informal in-depth studies, even though the data cannot be completely quantified or the study repeated with the same findings. This applies particularly to sensitive areas such as defecation behaviour.

Studies on social acceptability have a future because there is a lot of scope at the micro level of individual behaviour, at understanding the financial status of respondents, etc., as well as at the macro level of culture and social structure. It is, therefore, worthwhile to become involved in this field.

---

Feachem, R. 1980. Community participation in appropriate water supply and sanitation technologies: the mythology for the decade. (Unpublished)

Jackson, T. 1978. Rural sanitation and community learning lessons from participatory research. (Unpublished)

Tanon, M. 1978. Model for education intervention in malnourished populations. *American Journal of Clinical Nutrition*, 31, 2279-2283.