



THE IMPLEMENTATION OF URBAN AND RURAL SANITATION PROGRAMMES IN BOTSWANA

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1 INTRODUCTION

Over the past few years many papers have been published and presented which have focused upon the merits and demerits of various low cost sanitation technical options. Quite a few have been based solely upon theory and therefore this paper has been written to redress this situation by concentrating upon the existing and proposed methodology, costing and experiences gained by the Botswana Government in implementing both urban and rural low cost sanitation programmes since 1980.

2 URBAN SANITATION PROGRAMMES

In 1979 the Building Research Establishment in the UK developed an experimental double ventilated improved pit latrine which was referred to as the "PIP latrine" (Permanent Improved Pit latrine) (ref. 1). Subsequent discussions with the Ministry of Local Government and Lands in Botswana led to its adoption as the sanitation unit in an urban squatter area upgrading programme in Gaborone. In Botswana this type of latrine is referred to as the REC II (Revised Earth Closet II) (ref. 2). The construction of some 1700 REC II units as part of this upgrading programme proved invaluable in the subsequent implementation of site and service sanitation programmes. The features of the REC II have been referred to in the past in other publications (ref. 1, 2 & 3). The main advantage from the recipients point of view is that it allows continuous sanitation facilities even though one pit may be full by alternating to the second pit and from the local authorities point of view it allows flexibility in emptying and the handling of a harmless and inoffensive content.

The cost of constructing the REC II substructure in 1980 was comparable to the existing ROEC latrines at P275 (1 pula = £0.60 or US \$ 0.95, December 1982) and considered technically superior to them. It was also considerably less expensive than the aqua privy which was being introduced at that time.

Early observations indicated that there was a need for both health and user education campaigns together with suitable legislation and improvements to the design before further

implementation of similar sanitation programmes could take place.

It was seen for instance that even though a REC II Substructure had been constructed on each plot there was a very slow response from the plot-holders to complete the superstructure and use the latrine (ref. 2). It was decided that a health and user education campaign be started by the Self Help Housing Agency (SHHA) to overcome this problem. Other problems to be overcome by this means were (a) claims that the pits were too shallow and would therefore fill too quickly (b) the misuse of the unit mainly by children who would remove the cap and defecate in the unused pit and (c) the habit of pouring wash water into the pits and thereby flooding them (ref. 2). At the same time the latrine slab was altered to incorporate fixing points for a gum pole framed superstructure. The purpose of doing this was to encourage superstructures to be built of materials which the plot-holder might find more financially attractive. To underline the importance of completing and using the sanitation units it was also decided to introduce as part of the agreement between the plot-holder and the SHHA the legislation that the plot-holder had to complete the superstructure to SHHA's approval within three months of signing the certificate of rights or face the possibility of repossession of the site. This had to be carried out in advance of the construction of the house though the construction of temporary accommodation was permitted.

A building materials loan is available from the SHHA and currently the materials cost of a cement brick latrine superstructure is approximately P185. This compares with P564 for the cost of materials to build a basic one room house. The plot-holder is limited to a maximum building materials loan of P800 which must be paid back at an interest rate of 9% over 15 years. The sanitation superstructure at P185 will therefore represent a repayment of P1.90 per month.

Monitoring of the original REC II substructures has revealed that it is essential that they are block lined except

when constructed in hard pickable material. A subsequent redesign of the substructure has resulted in both the lined and unlined substructures costing approximately the same amount. This has been achieved by slightly reducing the plan area of the lined version and at the same time it has also been found that the increased costs due to the lining has been offset by savings made by omitting the reinforced concrete ring beam which is now used only on unlined versions. The current (November 1982) lined REC II substructure costs P310 in Gaborone (see table 1) to construct and this represents a repayment by the plot-holder of approximately P3.00 per month or approximately 25% of his monthly levy rate which represents SHHA capital and recurrent costs which are recovered at a rate of 8% over 25 years. It does not include repayment of the building materials loan but the total monthly levy rate of approximately P12.00 does include a service charge of P0.75 to cover the cost of emptying and maintaining the REC II substructures.

One successful method that has been introduced to reduce the overall total cost of the REC II substructure has been to split the contract into two distinct parts. The excavation or groundwork is let out in 50 or 100 unit lots to small contractors. They usually employ manual labour as opposed to expensive machinery and have very low overheads.

Incentives or targets are introduced to encourage these contractors to vie for additional contract lots. A very realistic contractual price is usually achieved. The second part of the contract is tendered for by larger contractors who have precast concreting facilities. They tender to precast the latrine slabs and deliver to site where the small contractor will place them. This is an attractive contract to the larger contractor and is usually let in units of 1000 or 1500 at one time. Again a realistic contractual price is usually achieved and by employing this method construction rates of 12 complete slab units per day and 18 complete ground work units per day have been achieved. Over a sixteen month period in Selebi Phikwe for instance some 3500 complete REC II substructures have been constructed.

A high rate of construction is essential to prevent potential squatter development as it is also a legislation that no plot will be allocated unless there is already an approved sanitation substructure constructed on it.

At this rate of construction it is also essential that proper supervision of the contractors is maintained. In order to achieve this the SHHA technical assistants responsible for contractor supervision attend periodic construction training

TABLE 1 COMPARATIVE COSTS OF REC II SUBSTRUCTURES

LOCATION OF REC II SUBSTRUCTURES	TYPE	LOWEST TOTAL COST OF SUBSTRUCTURE			
		NOV 1980 Pula	NOV 1981 Pula	MAY 1982 Pula	NOV 1982 Pula
GABORONE	Lined				310
	Unlined	275			
FRANCISTOWN	Unlined			314	
SELEBI PHIKWE	Lined		286	322	
	Unlined			302	
JWANENG	Lined				556

1 Pula = £0.60 or US \$ 0.95 December 1982.

NOTE: 1) The current 23% increase in cost at Francistown, some 450 km to the north of Gaborone, is due to transportation costs.

2) The current 79% increase in cost at Jwaneng, some 200 km to the south west of Gaborone is due to a combination of both transportation and contractors localised increased costs.

courses held in conjunction with the local Polytechnic.

3. RURAL SANITATION PROGRAMMES

Approximately 80% of the population of Botswana (936,000 preliminary figures 1981 National Census) live in the rural areas. The average population density is 1.5 persons per square kilometre. To implement successful rural sanitation programmes in these conditions calls for considerable planning. This situation is aggravated even greater by the rural tradition whereby the villagers leave their villages for the "lands" for approximately two thirds of the year. The "lands" may be up to 30 km away and distributed around the village. Timing is therefore very important if one is to initiate any sort of campaign otherwise one may find if one mistimes the commencement of a programme that there are no recipients. To locate the recipients and initiate campaigns at the "lands" is not feasible.

A rural pilot project was initiated in six villages which was aimed at improving public health through multi-media health education and improved sanitation systems. It was found that in order to initiate a successful project great emphasis must be placed upon social acceptability, affordability, and a willingness by the recipient to participate on a self help basis.

The villagers were involved from the commencement of the project with decisions relating to social preferences and acceptability of technical options. A variation of the ZIMVIP (ref. 5) latrine was used and it was interesting to note that contrary to findings in Zimbabwe the social preferences in Botswana were for square shaped superstructures with doors and the use of a seat rather than squatting.

Social surveys were carried out to establish the maximum level of affordability of the majority of recipients. This was found to be in the order of P26.00. The real total cost of the latrine, including all materials, labour and transportation was estimated to be in the order of P190.00 which could only be afforded by 3% of the rural population (ref. 4). It was therefore established that a large subsidisation element must be present in order to successfully carry out rural sanitation programmes.

Another key factor to the successful implementation of rural sanitation programmes has been the use of existing cadres such as the village based family welfare educators and assistant community development officers. Being village based their advice is far more

readily acceptable to the potential recipient that say a representative from the District Authority or Central Government.

Current Government policy states that rural sanitation programmes will be implemented on a district by district basis and when the individual district feels that it is capable of carrying out the work.

The implementation procedures have now been drawn up in the form of a District handbook based upon the findings of the initial pilot project. To date three of the ten districts have put forward their sanitation proposals and implementation plans covering the next five years. This it is hoped will cover 40% of the rural population and multi lateral donor funds have been secured to subsidise and assist these proposals. It is anticipated that the other districts will follow suit in the near future provided suitable funds can be made available.

Only now, having established the capabilities of the districts, the acceptable technical solutions, the level of affordability and an efficient delivery system, can long term rural sanitation programmes be implemented with confidence.

CONCLUSIONS

In both the urban and rural cases it is believed that the correct technical and socially acceptable sanitation solutions have been adopted. The question mark however lies over affordability. The Author firmly believes that an equitable sum must be paid by the recipients for their sanitation units. This will lead to a commitment on their behalf which, provided prior consultation with them regarding social acceptance has already been made, will be an important factor in the continued correct use and maintenance of the units. Obviously health and user education are also very important but it has been seen in some countries that where the sanitation units have been constructed at no cost to the recipients they have quickly fallen into misuse and disrepair even though health and user education campaigns have been carried out.

Surveys have shown (ref. 4) that in the rural areas the maximum amount that people are prepared to pay for their sanitation units lies between P20.00 and P30.00. The current real full cost of the rural sanitation unit is in the order of P200 and therefore the difference must be subsidised by Government and or a donor agency. As domestic funds are becoming scarcer in Botswana a greater burden is being placed upon the donor agencies

to increase their proportion of the subsidy. The fact that a proportion of the real cost is recovered from the recipient and also that a self help element is introduced into the construction of the units shows a willingness and commitment by the recipient which might encourage the donor agency to think that its funds will be well spent.

In the comparatively more affluent urban site and service areas the situation is completely different. To date all the urban site and service sanitation projects apart from upgrading ones have been funded from domestic funds. The policy has been one of total cost recovery. The only form of subsidisation to the recipients has been the levying of a lower than economic rate of interest on the capital and building loans. Clearly, as construction costs of sanitation units increase together with the increasing costs of the other components parts making up the monthly levy rate, the ability of full cost recovery from the recipients in site and services areas becomes more difficult. Having standardised upon the type of sanitation unit to be used in site and service areas the Government is very reluctant to lower that standard.

An example of the lowering of standards would be the introduction of the single pit latrine to replace the double pit latrine. Government could justifiably be criticised by recipients for being discriminatory. From the technical point of view there are advantages to the local authorities in continuing with the double pit latrine, the main one being its flexibility with regards to emptying. Having allowed the contents of the full pit to mature and decompose for one year the local authority still has a further three years during which time it can empty the contents before the alternative pit is full. Even with limited resources and taking into account the inevitable mechanical breakdowns the local authorities will be able to maintain an efficient emptying service and at the same time always provide the recipients with sanitation facilities, using the second pit.

The situation will not occur if the single pit is reintroduced into the urban areas. When these pits are full the responsibility is placed immediately upon the local authority to empty them otherwise the recipient has no alternative sanitation facilities. Inevitably this form of emptying procedure will be on an ad hoc basis and will lead to an inefficient use of labour and plant and possibly the purchase of an excessive number of emptying tankers than required in order to compensate for mechanical breakdowns. The alternative is to dispose with an emptying

service all together and to place the responsibility of relocating the sanitation unit when full on the recipient. This will not work in an urban environment. It assumes that all the recipients are capable and have the resources to carry out this relocation. It further assumes that those that are not capable of doing so, do have the funds available to pay others to do it for them. It does not take into account local ground conditions such as rock, sand or high water table levels which will require special skills to overcome. It further places unacceptable responsibilities upon the local authorities to supervise this work which is bound to be on a piece meal basis.

In conclusion there are still some problems to overcome in Botswana if the correct methods of implementation of sanitation programmes are to be maintained, taking into account current technical options, social acceptability and above all affordability. This is under constant monitoring and review by Government in order that an equitable solution is found and standards are maintained.

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