Sanitation in Developing Countries

Archives of a workshop on sanitation held in Lobatse, Botswana, 12-14 August 1980
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Sanitation in Developing Countries

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

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Financing of Low-Cost Sanitation Schemes in the Urban Areas of Botswana

Brian Bellard

Since independence in 1966, the rate of urban growth in Botswana has increased steadily as a result of rural dwellers moving into towns in search of higher earnings and better living conditions and also as a result of a very high birthrate, particularly in urban areas.

Fortunately, this growth has been at a steady rate and with two notable exceptions town councils have, with government assistance, been able to sustain development at a sufficiently high level so as to avoid the occurrence of squatter areas becoming a serious problem. The two squatter areas that did develop prior to the commencement of major development were in Gaborone and Francistown and have now been upgraded to a standard similar to the new urban developments.

Government Policies

The Government of Botswana has a declared policy concerning urban development stating that such development should not encourage urban growth. To achieve this aim, dwellers in urban areas must be required to pay for the services they receive. The government also has a policy requiring that a fundamental principle of planning should be the primacy of access to services for the poor. To achieve these policies it is necessary to avoid polarization of large blocks of low-cost development by encouraging the integration of various standards, including high- and low-cost housing, site and service areas, and commercial development, all within each major block.

General Standards of Infrastructure in Site and Service Areas

In general, the standards adopted by government have been as follows: (1) roads: primary, double seal coat; secondary, single seal coat or gravel; tertiary, scraped earth; (2) water supply: standpipe ratio of approximately 1 for every 20 plots; (3) sanitation: approved "low-cost" system (only substructure provided).

Funding of Urban Development Projects

Financing for these projects comes from various sources, e.g., the Broadhurst II development in Gaborone received grants from the United Kingdom, Canadian International Development Agency (CIDA), and the Economic Development Foundation (EDF); a loan from the United States Agency for International Development (USAID); and also Botswana government domestic development funds. To enable such a project to be self-financing, a cross subsidy system is operated whereby about two-thirds of the costs of infrastructure development for site and service are recovered by plot sales in the commercial, industrial, and high- and medium-priced resident-
ial areas. This reduces the amount of funds to be on-lent to the town council and to be recovered by way of a service levy. In this way, the service levy has been kept at a reasonable level of affordability in most areas. There is a default rate of about 30% in most towns but this is thought to be the result of poor legislation, which provides little power to recover unpaid levies. This legislation is now being amended and it is hoped that default rates will be reduced to less than 5%, i.e., only those who show genuine hardship will be able to default.

In addition to the service levy, a plot-holder will also have a monthly commitment to repay any building material loan that may have been taken out with the town council (maximum loan P600 (P1 = U.S.$0.74)) in order to construct a house and sanitation unit superstructure.

Some later projects, notably the urban II developments in Selebi Pikwe and Francis-town, have relied heavily on loans (World Bank) and this results in a much greater proportion of funds being on-lent to council for recovery by levies, even after cross subsidies have been taken into account. The government is currently looking into this situation to see how such costs can best be recovered without setting service levies at such a high level that there would be little chance of recovery irrespective of the legislation in force.

Unfortunately, to further complicate the situation, lending agencies have been reluctant to allow a realistic amount within their loans for the provision of sanitation units and it has, therefore, fallen upon the government to provide funds for these from domestic sources. Once again, to keep the service levy as low as possible the terms of this financing have had to be considered in detail.

Financing for Sanitation Units: Urban II Project

The appraisal report for this project included P70 per plot, for each of the 6500 plots, for the provision of a sanitation unit substructure of an approved type. The current costs for the various types of sanitation units suggested for urban areas are indicated in Table 1.

The number of sanitation units to be provided in this particular project is 9050, as opposed to the 6500 in the original assessment. The total includes some units not provided under the earlier urban I project. The estimated costs for the 9050 units are:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit cost</th>
<th>Cost of 9050 units (1 pula = U.S.$0.74)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIP</td>
<td>173</td>
<td>P1583750</td>
</tr>
<tr>
<td>ROEC</td>
<td>275</td>
<td>P2488750</td>
</tr>
<tr>
<td>REC II</td>
<td>275</td>
<td>P2488750</td>
</tr>
<tr>
<td>Type B</td>
<td>425</td>
<td>P3846250</td>
</tr>
</tbody>
</table>

In order to provide a framework for reaching a decision on this matter, the following principles are being adhered to: (1) a unit shall be provided on 85% of the plots as part of the infrastructure development; (2) on the remaining 15%, the plot-holders should be given the opportunity to install an acceptable system of their choice (waterborne or septic tanks as these plots will be chosen near main services or in areas with good soakage characteristics); (3) the type of unit selected must balance capital construction costs against recurrent servicing costs to prevent town councils from becoming burdened with hard to service units; and (4) the cost recovery scheme must be affordable by at least 80% of the plot-holders, which according to statistics indicates an income level of P300 per annum.

An analysis of the impact of cost recovery must take into account all aspects of the levy charge and not simply the cost of the sanitation units alone. Unfortunately, current studies of levy costs are not yet concluded, but it is estimated that this will not be less than P5.25 per month per plot, exclusive of the sanitation unit.

If the levy, exclusive of the sanitation unit, is P5.25 per month and the goal is to find a solution affordable by a family with an income of P300 per annum, it will be necessary to consider the implications of the government providing this financing to
Table 1. Costs of sanitation units for use in urban areas.

<table>
<thead>
<tr>
<th>Type</th>
<th>Substructure costs (1 pula = U.S.$0.74)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vented pit (VIP)</td>
<td>P175</td>
<td>Cheapest solution, but not regarded as particularly suitable for urban conditions. Major difficulties are those of emptying, particularly when a concrete superstructure is erected. In rural areas a new pit is usually dug and the slab and superstructure, constructed of indigenous materials, are moved when necessary</td>
</tr>
<tr>
<td>Reed odourless earth closet (ROEC)</td>
<td>P275</td>
<td>Soiling of the chute is a problem, leading to excessive water usage in a dry system. Emptying difficulties are overcome (i.e., pit is offset), but councils have to respond immediately once unit is full</td>
</tr>
<tr>
<td>Revised earth closet (REC II)</td>
<td>P275</td>
<td>A double-pit system yet to be finally proved but now being widely accepted as the best option, given suitable ground conditions. When the first pit is full the seat is moved, thereby giving councils time to respond for emptying. Pits are offset</td>
</tr>
<tr>
<td>Type B (aqua privy)</td>
<td>P425</td>
<td>Particularly suitable where groundwater pollution is a problem. Can be upgraded to sewered system. Easily emptied by councils</td>
</tr>
</tbody>
</table>

Table 2. Annual income required to meet various levels of sanitation and building material loans. a

<table>
<thead>
<tr>
<th>Sanitation loan</th>
<th>Building material loan (pula)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan (pula)</td>
<td>Grant (pula)</td>
</tr>
<tr>
<td>4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>362</td>
</tr>
<tr>
<td></td>
<td>327</td>
</tr>
<tr>
<td></td>
<td>300</td>
</tr>
<tr>
<td>6%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>371</td>
</tr>
<tr>
<td></td>
<td>331</td>
</tr>
<tr>
<td></td>
<td>300</td>
</tr>
<tr>
<td>9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>385</td>
</tr>
<tr>
<td></td>
<td>335</td>
</tr>
<tr>
<td></td>
<td>300</td>
</tr>
</tbody>
</table>

| aCalculations based on a P5.25 (1 pula = U.S.$0.74) levy being in force (e.g., a levy of P5.25 plus a 9% sanitation loan for P275 and a building material loan of P600 requires an annual income of P678). |

In addition to the service levy, a plotholder is also required to repay any building material loan taken out to cover the cost of materials for the construction of his dwelling and sanitation unit superstructure. The current maximum loan is P600 and the average loan is about P450, the loan having to be repaid over 15 years at an interest rate of 9%.

It is essential, therefore, that a plotholder in a site and service area be able to afford to repay, out of his income, both the service levy and a reasonable building material loan. Table 2 shows the annual income
required to meet various levels of building material and sanitation loans.

Because of low incomes, not everyone is able to afford a starter house on this basis. There are two methods, therefore, of overcoming this problem: (1) by giving a direct grant, which would be contrary to government policy, or (2) by reducing standards. In order to avoid the grant situation, four possibilities have been examined to reduce costs in relation to sanitation: (1) Eliminate sanitation units from development plans. This was rejected as totally undesirable. (2) Use direct labour construction teams. Experience has shown that the councils' own labour force is generally no less expensive than contractors. (3) Use more "self-help" labour in the construction of sanitation units. This method results in increased supervision and overheads, as well as delays, which all result in pushing up costs even further. (4) Build to reduced standards. With the cost of the units varying widely according to type, this solution must be carefully considered with respect to recurring costs.

In order to achieve all of these objectives, a proposal was made to the Ministry of Finance that the following plan should be adopted for the urban II project:

(1) Proposed unit: REC II (double pit).

(2) General description and advantages of plan: (a) a total of 9050 units are to be installed by contract at a cost of P275 per unit; (b) the plots will have a unit installed at the time of allocation; (c) the unit can easily be serviced and has the lowest recurrent costs; (d) all units can be installed within 6 months; and (e) there are no special staffing requirements or problems.

(3) Proposed financial basis: (a) government grant of P100 per plot to councils; (b) government provides a P105 per plot loan at 4% over 15 years; (c) existing World Bank funding of P70 per plot, for 6500 plots, to be passed to councils at 3% over 15 years; and (d) government to provide an additional loan of P70 per plot at 3% over 15 years for the 2550 plots not covered under (c).

(4) Affordability: assuming a P5.25 levy and the above loan requirements (i.e., P105 at 4% over 15 years; P70 at 3% over 15 years), an annual income of P314 would be required; an additional P600 building material loan would bring the required income up to P600.

(5) Total additional funds required: 3% + 4% loans, P1128750; grant, P905000; for a total of P2033750. Assuming that 10% of the 9050 plots will elect to install their own waterborne or other systems, the amount of additional funds required is P1830375.

Conclusions

The recommendation made is to change government policy, to a certain extent, on the subsidization of urban development. However, the subsidy has been restricted solely and specifically to the sanitation unit and it is not proposed that this become a general policy, but be adopted only where there is insufficient financing available through donor funding or cross subsidies to provide a sanitation unit of desirable standard and at the same time keep the service levy to an affordable level.

The proposed plan allows for the service levy and sanitation loan to be within the financial ability of 80% of the population. At the lower end of the scale only a very small amount of building material loan would be affordable, but a P100 loan is usually sufficient for an initial one-room dwelling and this should be affordable with an annual income of P400.