MAENDELEO

DEVELOPMENT

MINISTRY OF LOCAL GOVERNMENT AND LANDS

NATIONAL RURAL SANITATION PROGRAMME

STRATEGY PAPER (DRAFT)

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NATIONAL RURAL SANITATION PROGRAMME

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CONTENTS

ANNEXES

ABBREVIATIONS

BOTVIP	Botswana Ventilated Improved Pit (Latrine)
BRL	Blair Research Laboratory, Zimbabwe
CDC	Central District Council
CDD	Control of Diarrhoeal Diseases Programme
DDSS	District Development Support Sector
DHENO	District Health Education and Nutrition Officer
DSL	Department of Surveys & Lands
DTRP	Department of Town & Regional Planning
DWA	Department of Water Affairs
ESPP	Environmental Sanitation and Protection Pilot Project
FWE	Family Welfare Educator
GoB	Government of Botswana
HEU	Health Education Unit (MoH)
IDRC	International Development and Research Council
KAP	Knowledge, Attitudes and Practices
KGDC	Kgatleng District Council
KWDC	Kweneng District Council
MFDP	Ministry of Finance & Development Planning
MoH	Ministry of Health
MLGL	Ministry of Local Government & Lands
MWTC	Ministry of Works, Transport & Communications
NDP6	Sixth National Development Plan
NDP7	Seventh National Development Plan
NRSP	National Rural Sanitation Programme
ORS	Oral Rehydration Salts
SDC	Southern District Council
SHHA	Self-Help Housing Agency
SIDA	Swedish International Development Agency
SHESP	Self-Help Environmental Sanitation Project
ULGS	Unified Local Government Service
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VEW	Village Education Worker
VIP	Ventilated Improved Pit (Latrine)
WHEP	Water Hygiene Education Programme

SUMMARY

I SUMMARY

Introduction and Background

1.1 The National Rural Sanitation Programme (NRSP) subsidises rural people to enable them to build pit latrines at their homes. Following the recent Cost Analysis and Knowledge, Attitudes and Practices studies, the Ministry of Local Government and Lands (MLGL) has commissioned Maendeleo (Botswana) to prepare a strategy paper to assist in preparing a programme strategy for the NRSP over the planning period of the Seventh National Development Plan (NDP7) and beyond.

1.2 Three main strategic options have been examined. It is our conclusion that the strategy should be based on increased health education, improved technologies and phasing out of government latrine construction and subsidies (Strategy Option 3). The advantages and disadvantages of all three options have been set out to assist government in its choice of strategy.

Programme Aims and Objectives

1.3 The NRSP does not have clear aims and objectives. The thumbnail sketch in the national development plan has the aims of a construction programme, but it is not clear what public policy objective that programme is meant to achieve. Health education is currently not emphasised.

1.4 Recent studies have shown that latrines do not improve public health unless accompanied by other improved hygienic practices, and that such practices are not being widely adopted. NRSP latrines are not affordable without high levels of subsidies and as a result subsidies have become the main 'selling point' of the NRSP; they have discouraged households from taking responsibility for improving their own sanitation facilities and hygiene practices.

1.5 A more effective approach will be for government to educate people about how to improve their hygiene and environmental sanitation and also to develop a better range of technologies, so as to establish a genuinely motivated demand for latrines which does not depend on government provision or subsidy.

1.6 Of the strategic alternatives, Strategy Option 1 entails a continuation of the present emphasis on latrine construction, Strategy Option 2 provides for development of a range of better technologies and Strategy Option 3 involves a radical shift in emphasis to health education, with better technologies and phasing out of council construction activities and subsidies.

1.7 Under Options 1 and 2 government is responsible for much of latrine provision, maintenance and financing. Under Option 3 a major aim is for householders and the private sector to take on these responsibilities and for government to concentrate on health education and technology development.

1.8 The target population for Options 1 and 2 could be based on all rural housing units without some form of toilet facility. This would exclude owners of existing latrines, who have mostly not been involved in the NRSP and have generally not adopted good hygiene practices. Institutional users, such as schools would also be excluded. Under Option 3 all these would be included in the target population to be assisted through health education.

1.9 Since health risks vary between settlements each council should develop a priority ranking system which attaches greatest importance to actual sanitation needs. To establish such a system councils need to conduct surveys to determine health risks and the existing latrine coverage in their districts.

1.10 According to MLGL and council officials, an appropriate target level of coverage for Options 1 and 2 would be for 60 percent of the housing units of the target population to have latrines by 2010, which would entail building between 3,000 and 4,000 latrines annually for the next 30 years. Under Option 3 a more appropriate target would be for 60 percent of the target population to have acquired the knowledge, attitudes and practices to be able to determine and provide for their own sanitation needs. If such a target were achieved we expect that this would generate a level of latrine coverage at least equal to that under Options 1 and 2.

1.11 A clear set of aims and objectives must be agreed as part of the NRSP strategy. Due to its advantages in terms of effectiveness and sustainability, these should be based on Option 3.

Context of the Programme

1.12 In terms of policy, the NRSP falls under MLGL which has policy responsibility for sanitation, the national settlement policy, preventive health care and housing.

1.13 In view of these policy responsibilities, and since councils are responsible for implementation activities, MLGL should retain overall responsibility for the NRSP . As government's principal advisor on health matters, the Ministry of Health (MoH) is responsible for technical and professional guidelines and standards regarding health aspects.

1.14 Botswana has been slow to realise the importance of sanitation, which

has contributed to a lack of policy guidance and leadership for the NRSP. As part of the strategy process a series of workshops and seminars should be held to involve politicians and senior officials in discusson of important issues. Strategic choices should then be made and decisions taken at political level. Politicians and community leaders should then be involved in promoting implementation of the strategy.

1.15 Existing settlement patterns, land ownership and approaches to infrastructure provision can cause problems for latrine construction and access. In larger villages it may be expected that physical planning regulations and housing programmes will increasingly determine the construction and upgrading of toilet facilities. This will present problems for a public latrine construction programme (Options 1 and 2).

The Technology

1.16 The existing BOTVIP latrine was intended to satisfy the design principles of long life, ventilation and insect control, safety, self-help construction and ease of maintenance. However, the latrine is expensive to build and has only a short life because it cannot be emptied when full.

1.17 A better and more affordable range of technologies needs to be developed (Options 2 and 3). This should be based on the original design principles and encompass low-cost, standard and upgradeable types. There is some scope for improving the BOTVIP design but more radical solutions will be needed for a truly low-cost facility.

1.18 Unless better technologies are introduced, the participation of households will depend on offering high subsidies and will fall sharply when people discover that the latrines cannot be emptied. Only if better technologies are accompanied by improved health education (Option 3) can it be expected that they will lead to improvements in public health.

Affordability and Subsidies

1.19 NRSP latrines are expensive and a high level of subsidy is needed to 'sell' these to the public. In 1990 the average cost of an NRSP latrine was P 1,650; roughly 70 percent of this was met through government subsidies. Since the latrines are not emptyable and will become unusable after about eight years instead of the 20 years originally envisaged, their cost on an annualised basis is excessive.

1.20 Subsidies have become the main selling point of the NRSP, rather than the advantages of investment in latrines as housing assets and for improving health standards. Subsidies have reinforced the myth that government should

provide and maintain household sanitation facilities and have created an artificially induced demand for NRSP latrines which has concealed the fact that they are too expensive. Subsidies should therefore be phased out. This will require a more affordable range of technologies to be developed and an improvement in public awareness about their sanitation needs (Option 3).

1.21 Funds should be made available through council social welfare provision to provide low-cost type latrines for vulnerable groups including destitutes. Since destitutes are not effective at marketing of latrines, the practice of siting demonstration latrines at the homes of destitutes should be stopped; these should instead be located at prominent public places where they are likely to be seen by more people.

Overall Approach to Latrine Provision

1.22 There is some scope for improving the efficiency of the existing council and contractor delivery methods, but a radical change is needed if this is to become sustainable in financial terms. Both short term and long term changes of approach are suggested under Option 3.

1.23 In the short term a self-help package could be introduced, whereby approved latrine 'kits' would be supplied by the private sector and installed by householders (or builders appointed by them). This approach would avoid the delays in obtaining an NRSP latrine under the existing delivery methods. Households could also save costs by negotiating competitive prices with local builders or by building the latrines themselves. The package could initially be introduced in parallel with the existing delivery methods.

1.24 In the longer term the intention would be to establish a complete self-help approach, with provision and supply of materials and components being undertaken by households and the private sector. We calculate that the national market for latrines is capable of supporting competent and well financed private sector providers and suppliers. To implement this approach it would be important to involve the private sector in the development of the NRSP. Involvement of the private sector would also offer economic and political advantages by supporting private enterprise and employment creation.

1.25 The NRSP should also include a programme of low-cost upgrading to improve the health impact of non-programme latrines. This would involve attaching of ventpipes and flyscreens.

1.26 The existing delivery methods should be kept in place until the improvements in health education and technology have been implemented.

Health Education and Social Mobilisation

1.27 The KAP study shows that households lack adequate knowledge, attitudes and practices about sanitation and environmental hygiene. Under these circumstances NRSP latrines are not improving public health. The main explanation for this is that health education activities have been indadequate.

1.28 In addition to the NRSP, MoH assists sanitation through the Water Hygiene Education Programme and the Control of Diarrhoeal Disease Programme. The three programmes have different approaches to implementation and are poorly coordinated. They depend for educational materials on the Health Education Unit but this is understaffed.

1.29 The design of an improved health education strategy should be targeted at key problems and based on a series of priority messages. Implementation should draw on community facilitators as well as government extension workers. A multi-media approach should be used. The new health education methods should be tested before being extended to a national level.

1.30 The overall health education objective should be to increase peoples' understanding of the need for improved personal and domestic hygiene. A major indicator of impact will be the reduction in the incidence of exreta-related diseases. Latrines are only one of a series of improvements which would need to be promoted.

1.31 Mothers and older children should be priority targets for health education since they are expected to be more responsive.

1.32 An improved package of health education methods and materials needs to be developed for use by councils. This should feature a campaign approach in each district.

1.33 Implementation should be undertaken by a community team based around the council's community health workers, and drawing on family welfare educators, enrolled nurses and community groups when a campaign is active in their part of the district.

1.34 To maximise health impacts there is a need for much greater integration of the NRSP and MoH's two sanitation-related programmes. This could include an integrated set of messages and a joint programming approach. In the short term this can be assisted by increasing the emphasis of the NRSP on health education, development of overall district sanitation plans by councils and ensuring that one district sanitation coordinator has overall responsibility for implementation within each district.

Implementation Capacity

1.35 Most council construction programmes are short of qualified manpower, which limits their scope and contributes to low productivity. There has not been enough training of private contractors and households to build latrines.

1.36 If latrines are to be built by councils (Options 1 and 2) each council should have one district sanitation coordinator to manage the programme and village sanitation coordinators to provide full-time supervision of the private contractors who will build most of the latrines. Even on this basis annual construction capacity is expected to be limited to 3,000 latrines until towards the end of NDP7.

1.37 For all strategy options there is a need for more training of contractors using existing training schemes, and a further need for simplification of tender procedures.

1.38 By involving the private sector in manufacture and supply of latrine materials and fittings, Option 3 might eventually lead to the development of a series of approved technologies which could be supplied with government endorsement.

1.39 Under Options 2 and 3 it will be necessary to overcome the current lack of capacity for research and development into latrine technologies. This can be achieved by attaching technological expertise to an institution involved in technology development, such as Botswana Technology Centre or Rural Industries Innovation Centre. There is a need for more collaboration with research institutions in other countries, particularly Zimbabwe's Blair Research Laboratory.

1.40 The existing health education capacity of councils is limited, partly because of the competing demands of both latrine construction and other council health department activities. There are also problems in obtaining inputs from district health education and nutrition officers and family welfare educators.

1.41 The capacity of the MoH's health education unit for design of health education materials is limited by staff shortages. MoH's own programmes tend to receive greater priority than the NRSP.

1.42 A coordination plan should be prepared to integrate the approaches to the three existing health education programmes covering sanitation and to coordinate associated training activities.

1.43 Possible approaches for improving council health education capacity could include training health assistants in education methods; re-training and re-orienting family welfare educators; drawing on community resources

through schools, NGOs, Tirelo Sechaba; and use of expatriate volunteers to fill key professional and technical gaps.

1.44 The production capacity of the MoH health education unit needs to be expanded. Possible approaches include drawing on materials and methods developed elsewhere, recruiting additional manpower and contracting-out production work to private firms and NGOs.

1.45 None of the three strategy options require substantial increases in manpower and training. In each case an adequate capacity can be provided by filling gaps and, under Option 3, re-orienting the activities of existing staff and making more use of community organisations and self-help. However, an important result of deciding on the strategy will be to sensitise ULGS to the NRSP's manpower and training needs.

1.46 Some possible improvements in overall programme coordination have been suggested, including a permanent steering committee (all options), a technical sub-committee of the primary health care committee to provide an integrated approach to health education (Option 3), a private sector development group (Options 2 and 3) and providing a post of primary health care coordinator in MLGL (all options). If any of these is adopted care should be taken to limit regular involvement to a small number of key agencies.

Monitoring and Evaluation

1.47 Monitoring of latrine construction and expenditures by councils is already well organised. However, there has been little monitoring and evaluation of environmental health needs and impacts. Under Option 3 it will be essential to improve these aspects.

1.48 Such additional monitoring needs to be simple and easy for councils to implement and administer. Elements could include establishing an inventory of toilet facilities, periodic monitoring of a small number of key health and sanitation indicators and, possibly, epidemiological surveys to develop a better understanding of the causal relationships leading to environmental health risks. Additional monitoring of health education should focus on the performance of health education materials, the education and communication process and the impact on individuals and households. The choice of monitoring information should be based on the needs of the users, including council health departments, MLGL, MoH and financing agencies.

1.49 As far as possible, councils should be responsible for implementation of monitoring and evaluation. Annual district and national reports on monitoring of health and hygiene aspects should be prepared.

1.50 Periodic workshops should be held to review the performance of the NRSP against the aims and objectives of the agreed strategy.

1.51 Under Option 3, we consider that once the main changes of approach have been prepared and tested, government should commission an independent evaluation to ensure that all necessary modifications of approach are made before implementation moves forward on a national scale.

Plan of Action

1.52 We have reached the firm conclusion that a programme strategy for the NRSP is needed and should be based on Option 3. Before this or any other strategy can be agreed, it will first be necessary to achieve a better awareness of rural sanitation among politicians, senior officials and the community at large. During 1991 and the first half of 1992 a series of workshops and seminars should be held for this purpose, leading to approval of a strategy proposal at the National District Development Conference in 1992, followed by government approval of the strategy. We envisage that whichever strategy option is selected the approach to implementation could be prepared and tested by the end of 1994, and could be extended to a national level in 1995.

1.53 Our rough projections of future NRSP performances and costs indicate that there would be incontestable advantages in adopting Option 3. To achieve a comparable latrine coverage (60 percent in 2020), Option 1 would cost about P 190 million in constant 1990 prices while Options 2 and 3 would cost about P 100 million. Under Option 3 government would finance about P 40 million of costs and households would meet about P 60 million; whereas under Option 2 government would pay P 80 million and households only P 20 million. The projected financial advantages of Option 3 illustrate how a shift in emphasis to health education can reduce costs and reduce the reliance of households on government. The real bonus of Option 3 is the non-monetary one of greater impacts on overall public health as a result of better public awareness about sanitation and environmental hygiene practices.

CORE REPORT

II INTRODUCTION AND BACKGROUND

Introduction

2.1 The National Rural Sanitation Programme (NRSP) assists rural householders in the construction of sanitation facilities on a subsidised self-help basis and helps to improve hygiene behaviour related to water and sanitation through health education and social mobilisation programmes. The NRSP is coordinated by the Ministry of Local Government and Lands (MLGL) and implemented by the nine district councils. Drawing on the findings of the recent Cost Analysis[1/] and Knowledge, Attitudes and Practices studies[2/], MLGL has commissioned Maendeleo (Botswana) to prepare a strategy paper to assist in developing a programme strategy to guide the establishment of the NRSP over the planning period of the Seventh National Development Plan (NDP7) and beyond.

Background

2.2 The Government of Botswana (GoB) began subsidising on-site sanitation provision some 15 years ago in urban areas and 11 years ago in rural areas. Progress has since been made in the development and adaptation of appropriate latrine technologies; raising public awareness through health and sanitation education and promotion programmes; development of implementation methods under the responsibility of district councils; and in using self-help approaches to provision of sanitation facilities.

2.3 Ventilated improved pit (VIP) latrines[3/] were introduced in Botswana through the Urban Low-Cost Sanitation Research Project, which commenced in 1976 with financial support from the International Development and Research Council (IDRC). A double-vault VIP latrine was adopted as the standard by urban councils, who also promoted the concept that councils would provide the latrine substructure and householders would build and finance the superstructure.

2.4 Work on establishing on-site sanitation activities in rural areas began in 1980 through the Environmental Sanitation and Protection (ESPP)

1/ Maendeleo (Botswana), 1990

2/ Siapac (Africa), 1990. Throughout the strategy paper we have referred to the draft report of the KAP study. The final report of the KAP study was not yet available when we completed our work.

3/ VIP latrines were first developed by the Blair Research Laboratory in Zimbabwe during the mid-1970s. A key feature of the VIP latrine which has been adopted in Botswana is that, in addition to provision of appropriate designs of latrine substructure and superstructure, a vent pipe is fitted to expel odours and provide draught which discourages insect infestation of the latrine.

Pilot Project, funded by the United States Agency for International Development (USAID). The main aims were to:

- develop, test and evaluate approaches to health education and latrine provision;
- develop an appropriate rural sanitation technology;
- determine how the effective aspects of the project could be replcated on a larger scale.

2.5 The ESPP project was piloted in six small and medium sized villages in Southern and Kgatleng districts and eventually adopted improved VIP latrines (BOTVIPs) of the single-vault type for use in rural Botswana. It also compiled handbooks to assist future rural rural sanitation activities[4/] and helped to secure the support of district councils.

2.6 By 1984 GoB initiated the Self-Help Environmental Sanitation Project (SHESP), with assistance from UNICEF. This was to be a second phase of the pilot project begun under the ESPP, and was also aimed at overcoming the shortcomings of ESPP in relation to health education and project implementation, notably:

- ways of reaching more households;
- persuading them to use the VIP design;
- effective health education;
- providing VIP latrines for destitutes.

2.7 Through SHESP the project was extended to include Southern, Kgatleng, Kweneng and Central districts. This covered some forty large and small villages both in easily accessible and remote areas. Although the project completion date had to be extended from 1986 to 1988, the findings of the end of project evaluation[5/] were that substantial progress had been made in overcoming the shortcomings of ESPP and providing the basis for establishing a soundly based national rural sanitation programme. Some 3,500 project latrines were in use by 1988.

[4/] Handbook for District Sanitation Coordinators - GoB/UNDP/World Bank, 1983

[5/] SHESP End of Project Evaluation - GoB/UNICEF/World Bank/UNDP, 1988

2.8 In 1986, during implementation of SHESP, MLGL had also commissioned the preparation of a draft project memorandum for the Rural Villages Environmental Sanitation (Household Latrine Construction) Programme[6/] to be funded under LG51. This represented a further step towards designing a national programme and succeeded in increasing the budget allocation from P 2.2 million to P 7.9 million under the Sixth National Development Plan (NDP6). One significant innovation, which aimed at improving the rate and cost-effectiveness of implementation, was the introduction of the concept of substructure provision being undertaken by private contractors. Another, which for technical financing reasons was not adopted, was the proposal to separate funding and planning of latrine programmes in the major villages (more properly called rural towns) from those in the rural villages which were the subject of the project memorandum.

2.9 During the latter stages of SHESP various studies examined other aspects of a comprehensive programme strategy for the NRSP. Among these was the Botswana Rural Sanitation Costs and Tariff Study[7/] which provided a preliminary assessment of costs of provision in major villages; the recurrent costs of desludging; and methods of cost recovery.

2.10 By the end of 1990 the project had covered roughly 80 settlements which were broadly representative of the socio-economic characteristics, size and remoteness of the villages of Botswana[8/]. The process of extending sanitation activities to all districts was under way, particularly in the four original districts. South East and North West districts were limited at this stage to provision of demonstration units; in Ghanzi such units were still being constructed; in Kgalagadi tenders had not yet been awarded for construction of demonstration units; and in North West problems which have affected overall construction activities in the district were delaying progress. While programming is based on the VIP design, doubts about the appropriateness and affordability of this technology remain, and the search for alternatives remains part of the sanitation strategy.

2.11 During the first half of 1990, MLGL commissioned the Cost Analysis study and the KAP study on Water, Sanitation and the Control of Diarrhoeal Diseases. These two studies supplied the foundation for a programme strategy for the NRSP. The Cost Analysis provided a detailed comparison of the costs of VIP latrine provision and emptying in each district, including the options of substructure construction by council direct labour and by private contractors. It found that on average contractors were less costly than

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6/ Economic Consultancies Pty Ltd

7/ Interconsult Sweden AB (for MLGL) - 1988.

8/ The KAP study found no differences in the socio-economic characteristics of a sample of 30 project-assisted villages as compared with a random sample of 30 villages.

council direct labour. Projections of annual VIP latrine numbers and costs were prepared for the period from 1990 to 2019. On the basis of an assessment of the ability of councils to build VIP latrines, guidelines were laid down for programme management and budgeting. Two areas of uncertainty were also identified: because of high costs lower income households could not afford to take part in the programme; and there was no technology by which VIP latrines could be emptied for re-use.

2.12 The KAP study entailed a detailed questionnaire survey of nearly 4,000 households to determine the knowledge, attitudes and practices of rural householders regarding water and sanitation hygiene. This study assessed the impact of existing health education activities under the NRSP, the Water Hygiene Education Programme and the Control of Diarrhoeal Diseases Programme. It found that unless pit latrines are associated with overall personal hygiene and environmental sanitation, they have little impact on the problems of diarrhoeal disease and control. This reflects experience in many other countries[9/]. The study also found significant gaps between householders' knowledge, attitudes and practices, which suggests that health education has not been very successful.

Study Brief

2.13 The current study is to assist government in designing a NRSP programme strategy for the NDP7 planning period (1991-96) and beyond. The terms of reference are provided as Annex A. The strategy paper is to spell out the alternative directions in which the NRSP can move in terms of aims, target beneficiary groups, relationships with other activities, sanitation technology, and the approach to project implementation, health education and social mobilisation. The paper is also to examine ways of providing implementation capacity, the role of subsidies, financial contributions from central government, councils and households, and the nature of monitoring and evaluation required. MLGL will use the strategy paper to make decisions about establishing and institutionalising the NRSP on a permanent basis; as an overall guide in the planning of implementation; and for securing funding from domestic and donor sources.

Approach

2.14 In view of the breadth of issues to be covered, a multi-disciplinary team was needed to prepare the strategy paper. They were an expert on local government institutions (Brian Egner, team leader), an economist (Tyrrell Duncan), a sociologist and adult educator (Martin Byram), a public health

9/ Environmental Hygiene in SIDA-Supported Programmes in Africa - Nordberg and Winblad, 1990.

engineer (Norman Burns of Wolhuter & Associates) and a physical planner (Jan Warius of Swedeplan). Messrs Egner and Duncan had previously worked on the Cost Analysis study and had in the course of that study visited the NRSP implementing teams at all nine district councils.

2.15 Research on the study was conducted between March and June 1991. It mainly comprised:

- ***Desk Research:*** review of the Cost Analysis, KAP study and other relevant reports on rural sanitation and primary health care and information on comparative experiences in other countries.

- ***Interviews and Investigations:*** interviews with officials from MLGL, MFDP, MoH, GCC, SIDA, UNICEF, DTRP and several district councils. Field interviews and technical inspections of latrine construction and emptying at Central, Kweneng and Southern district councils.

- ***Focus Group Meetings:*** three half-day meetings covering overall strategy, hardware aspects and software aspects respectively. Strategy issues papers were used to stimulate debate on key subjects by participants from MLGL, MFDP, MoH, DWA, DTRP, GCC, Central and Kweneng district councils and UNICEF.

- ***Followup Research:*** interviews and further desk research to clarify issues raised during the focus group meetings.

Determining the Strategy Options

2.16 We have identified three main strategic options which we consider to cover the range of realistic strategic choices available to government. The options reflect the kinds of decisions which are required, and they take account of the conflicts, uncertainties and other impediments which have to be overcome. The first option assumes a continuation of the existing approach. The second assumes that there will be an improvement in the range of latrine technologies, but other aspects of the existing approach are retained. The third option envisages both an improved range of technologies and a significant shift in emphasis from latrine construction to health education and social mobilisation. The implications of these options are compared and evaluated throughout the study.

2.17 From our research and investigations, the findings of the KAP study and Cost Analysis, and the contributions of the officials who took part in the focus group meetings, we have reached a firm conclusion about which strategy option should be selected. We believe that a significant change of approach

is needed if the NRSP is make a major contribution to environmental health. In order to achieve this it will be necessary to adopt the third strategy option. We believe that this choice coincides with the views of the officials and elected representatives we have met, as well as those of representatives of resident donor agencies.

Report Structure

2.18 This report is structured in eleven main sections, as follows:

Summary: an overview of the main findings and recommendations;

Introduction and Background: explains the background to the NRSP and the study brief;

Programme Aims and Objectives: examines the overall aims and objectives and their contribution to programme strategy;

Context of the Programme: considers the policy setting for the NRSP, the roles of the different institutions concerned, and the need to take account of forthcoming physical planning requirements;

Technology: reviews the adequacy of the present latrine technology and explains why this has to be improved.

Affordability and Subsidies: assesses the costs of NRSP latrines and the need for subsidies, their effect on household participation and how to provide for the needy;

Overall Approach to Latrine Provision: examines how latrine programmes are implemented, and how they can be improved;

Health Education and Social Mobilisation: examines the adequacy of the present approach and suggests how to improve it;

Implementation Capacity: analyses the resources needed to implement the NRSP, and how these may could be provided for each of the three strategy options;

Monitoring and Evaluation: examines the adequacy of existing monitoring and evaluation and how to improve it to ensure that performance can be compared against overall aims and objectives;

Plan of Action: proposes a timetable of tasks to establish a national rural sanitation strategy.

The annexes to the study provide details of the terms of reference, the principal persons consulted, the cost assumptions and cost projections.

III PROGRAMME AIMS AND OBJECTIVES

Introduction

3.1 Precise aims and objectives for the NRSP have yet to be approved. This is partly because the NRSP is in transition from a pilot project to an overall national programme. The pilot project was confined to a fragment of the rural population and did not encompass clear national objectives. Overall aims and objectives are now needed for policy formulation and to guide promotion activities, implementation and monitoring. The approach to implementation has to provide a way of realising these aims and objectives.

Existing Aims and Objectives

3.2 For any project the thumbnail sketch (TNS) in the national development plan represents the overall scope of activities and expenditures which has been authorised by parliament. All project memoranda have to be limited to those activities and expenditures which have been approved in the TNS. As such the TNS provides the guidelines for a project, including aims and objectives. In the case of rural sanitation there have been no other policy directives from parliament, or at cabinet or ministerial level, which might be used to amplify upon the provisions of the TNS.

3.3 The NDP6 project heading for rural sanitation was LG51. Under NDP6 the TNS did not include precise aims and objectives. It stated that the pilot programme of latrine provision would be expanded, so as to 'broaden the geographical target areas which will benefit from improved sanitation facilities'. This was to be achieved by 'setting up of a sanitation unit within each district council.' Thus the project was still regarded as a pilot project, and its possible role as a national programme had yet to be determined. When during NDP6 the project was extended to all districts (and featured as an activity of council health departments in each district development plan), assumptions about aims and objectives which had arisen through the pilot project were adopted in the absence of any definition of national aims and objectives.

3.4 Under NDP7 the the new project heading for rural sanitation is LG144. According to the TNS for LG144 in the draft of NDP7[1/], the overall objective of rural sanitation activities will be 'to reduce the incidence of excreta related diseases by building pit latrines through a subsidised, self-help scheme'; and a construction target of 22,000 pit latrines will be set for the

[1/] Due to be presented to Parliament for approval in July 1991.

five-year plan period. The scope of the project has also been broadened to include the virtually unrelated subject of disposal of refuse and liquid and solid waste. Apart from this, the new version of the project in NDP7 largely represents a further continuation of assumptions developed through the pilot project, along with additional assumptions about the level of need and intended level of coverage which were partly drawn from the Cost Analysis.

Exhibit 3A: Thumbnail Sketches for NDP6 and NDP7

NDP6. Environmental Sanitation Programme (LG51)

As pilot programmes in low cost sanitation (excreta disposal) have shown encouraging results during the last plan period, their expansion is proposed for this plan period. The promotion of low cost options of excreta disposal (ie VIP latrines) involved activities in a limited manner in Kgatleng, Kweneng and Southern Districts 300 VIPs were constructed

The Environmental Sanitation and Protection Project (ESPP) and the Self-Help Environmental Sanitation Project have demonstrated that sanitation issues are a priority for a high percentage of the rural population Funding proposed for NDP6 will be utilised to broaden the geographical target areas which will benefit from improved sanitation facilities. The proper method of excreta disposal is one of the precepts of the primary health care targets. It is important that all districts be guided and supported towards improved health standards.

Funds under the project facilitate the setting up of a sanitation unit within each district council. Such units will be responsible for promoting the construction and proper use of VIP latrines Manpower requirements for this project comprise District Sanitation Coordinators and Village Sanitation Assistants Vehicles, equipment and materials will be provided.

NDP7 (Draft): Rural Sanitation Programme (LG144)

This project's objectives are to reduce the incidence of excreta-related diseases by building pit latrines through a subsidised, self-help scheme, and to provide facilities for the collection and disposal of refuse, solid and liquid waste in rural areas, particularly in major villages.

Some 10,000 pit latrines were constructed country-wide during the last plan period and refuse and sewage collection vehicles were procured. However, with the fast growth of major villages a need will continue to build additional pit latrines and arrange for disposal of waste and refuse. The target for NDP7 is 22,000 pit latrines Refuse trucks and sewage tankers will be purchased and satisfactory dumping sites for solid waste established.

3.5 On this basis the aims and objectives for rural latrine provision in NDP7 are even more loosely defined than they were before. The following important assumptions seem to have been adopted by default:

- latrine provision will reduce excreta related diseases;
- it is appropriate for government to act as provider of latrines for private households;
- in order to do this it is sensible to subsidise the cost of latrine provision;

- annual latrine construction targets should be adopted to achieve a target level of coverage of private households within a determined timeframe.

3.6 At a recent NRSP workshop attended by members of the study team[2/], health inspectors, health assistants and district sanitation coordinators representing all nine district councils revealed their differing perceptions of the aims and objectives of the project. In summary, they considered the NRSP as primarily *a programme to help rural communities to improve their health standards through adoption of better practices associated with disposal of human waste.* Construction of latrines was seen as the means of implementing the NRSP, rather than as its aim. We question below whether a latrine construction programme will really improve rural sanitation.

Exhibit 3B: Some Opinions of Health Inspectors

Perceived Aims of NRSP:

- complement health standards in rural communities
- assist in prevention of water pollution

Perceived Objectives of NRSP:

- provide for sanitary disposal of human waste
- raise awareness of health issues
- help people to get involved in improving their health

Need to Review Aims and Objectives

3.7 The KAP study and Cost Analysis have helped to identify a series of contradictions in the construction programme approach. Only minor provision has been made for health education and social mobilisation, yet there are serious gaps between public knowledge, attitudes and practices concerning sanitation. This deficiency prevents the health benefits of latrines being realised, since the provision of latrines is only one part of improving the overall sanitation and hygiene standards of households. For example, roughly two-thirds of children in households with pit latrines never use the latrine. Only a third of pit latrine owners consider improved health to be the main advantage. The need for better health education is critical in the light of the evidence which is now available that having a VIP latrine does not significantly improve health in the absence of improvements in water hygiene and environmental sanitation practices.

[2/] 12 to 13 March 1991, Sheraton Gaborone.

3.8 In settlements which have been assisted under the NRSP, the over-emphasis on construction has also discouraged private householders from taking greater responsibility for providing and maintaining their own toilet facilities. Existing NRSP promotion activities often seem to involve the 'selling' of VIP latrines to rural people based on the attraction of high levels of subsidy. People who do not understand how a latrine works or how it should be maintained, still want one because they will be receiving something for nothing and because of the convenience of having a latrine. With an average subsidy of 70 percent of cost, the public demand at this price far exceeds the real demand for VIP latrines if people had to pay the full cost. The present approach is high-cost and leads to sub-optimal latrine user practices and hence to a failure to realise potential improvements in public health.

Exhibit 3C: Contradictions in the Construction Programme Approach

Existing Assumption	Existing Experience	Expected Consequences
It is necessary for Government to provide a latrine building service	Rapid growth in rural construction suggests that there is sufficient private capacity to build latrines	General dependence on government; 'crowding out' of private sector
Latrines will improve environmental health	Only if accompanied by other hygiene and sanitation improvements	Failure of latrine provision to realise potential health benefits
Latrines will be used and maintained properly	There are major gaps in knowledge, attitudes and practices of households	Failure to realise potential health benefits; avoidable damage to latrines
Existing VIP latrines can be emptied and then re-used	An effective means of latrine emptying has not yet been devised	Latrines to be replaced when full, and annual sanitation costs to rise sharply
Government will provide latrine emptying services	Government does not have a means of emptying latrines; even if a means can be devised this may be costly	Dependence; rejection of manual options; criticism of government if it cannot empty latrines when full
Subsidies are needed to secure participation by households	Most rural latrines are provided independently of the NRSP; the high cost of VIP latrines requires subsidy	Dependency on government; high cost to Government; participation in NRSP partly to receive Government 'handouts'

3.9 It will be more effective and less costly to government in the medium and long term if public intervention in the field of rural sanitation is directed toward educating people in how to improve their hygiene and environmental sanitation. This is the only way to ensure that latrines will be properly used and maintained. Only through health education will households adopt the hygienic practices which are needed if latrines are to contribute to a reduction in excreta related diseases. Through education and social mobilisation efforts a genuinely motivated demand for latrines will be generated, rather than one based on the attraction of subsidies. When a

well-informed demand exists and when a more affordable range of technologies has been made available, householders can deal with their own latrine needs without government support. This is the general approach which has been adopted in countries which have achieved large-scale improvements in rural sanitation and environmental health, notably Zimbabwe[3/] and Lesotho[4/].

Defining Strategy Options

3.10 The three strategy options we have identified represent different sets of aims and objectives and associated means of realising them[5/]. By comparing the aims and objectives we can illustrate the range of choices available to government as to what the NRSP can achieve and how it can do so. The strategy options are:

- ***Option 1: Latrine Provision/Existing Technology:*** this is the existing approach. The aim is to reduce the incidence of excreta related diseases through the construction of VIP latrines jointly by councils and households, on a subsidised basis. The main yardstick of performance is the number of project-assisted latrines which are built. Health education remains inadequate with a consequent low level of public awareness about environmental health and sanitation. Given the high cost of the existing technology, subsidies are necessary to induce households to participate. Existing weaknesses in the technology are not addressed.

- ***Option 2: Latrine Provision/Improved Technology:*** a partial modification of the existing approach. The aim and the means of measuring performance are similar to Option 1. A better, more affordable range of latrine technologies is developed and introduced. Average costs are reduced, so the subsidies are also reduced. Health education and community mobilisation remain unchanged, as do the gaps in public awareness and the dependence upon government assistance.

- ***Option 3: Health Education/Improved Technology:*** a radical change in approach. The main aim is to reduce the incidence of excreta-

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3/ 'Rural Water Supplies and Sanitation: A Text from Zimbabwe's Blair Research Laboratory - Peter Morgan/Blair Research Laboratory, 1990

4/ Rural Sanitation in Lesotho: from Pilot Project to National Programme - UNDP/World Bank, 1990.

5/ We discarded a possible fourth strategy option which might involve greater emphasis on health education while using the existing technology. The existing technology is both defective and costly, and it must be improved before increased health education can be effective.

related diseases by educating the public about how to improve their lives by building pit latrines and adopting various improved hygienic practices. The main output measure is the reduction in the incidence of excreta-related diseases. Secondary output measures include the level of improvement in public knowledge, attitudes and practices, and the number of latrines built. Health education and community mobilisation activities of councils are expanded and improved. With an improved and more affordable range of technologies and a better informed public, the householders become less dependent on subsidies and eventually take over all responsibility for latrine provision and maintenance.

3.11 Broad aims and objectives like these need to be accompanied by more detailed definitions and guidelines if they are to be effective. Guidelines are required for the selection of beneficiary groups, the scale of activities, the division of responsibilities for implementation and financing, and the extent to which voluntary methods can be supplemented by regulatory devices. The definitions and guidelines will have social, economic and political dimensions which will need to be debated and agreed upon at policy level, and to form a major part of the national rural sanitation strategy.

Exhibit 3D: Further Questions About Aims and Objectives

Who will be the beneficiaries?

How will public participation be secured?

What is the scale of the project?

When will the aims be accomplished?

Who will conduct implementation?

Who will meet the costs?

Role of Government

3.12 Each strategy option entails a different proportionate sharing of responsibilities between government and households. Strategy Option 1 requires the most government involvement, from selection of recipients to the construction and subsequent emptying of latrines. Strategy Option 2 only differs slightly from this, in that government introduces a superior technology. Only Strategy Option 3 offers a radical reduction in direct

government involvement in latrine provision, with a greater number of roles being taken up by householders and private sector builders and suppliers. Government's main role under Strategy Option 3 is to expand health education; coordinate the development of better technologies; and involve private firms in supplying the demand for latrine. Subsidies are phased out, since a better educated public is able to make its own decisions about whether to have a latrine and what type to build. In the context of existing policies of self-reliance, encouraging the private sector, and reducing subsidies, the role of government under Strategy Option 3 is clearly to be preferred.

Exhibit 3E: Government's Role in Different Strategy Options

Aspect of Programme	*Strategy Option 1* Existing Approach	*Strategy Option 2* Improved Technology	*Strategy Option 3* Overall Change of Emphasis
Health Education	Government	Government	Government/Community
Selection of Recipients	Government/Community	Government/Community	Self-Selection by Households
Latrine Provision	Mainly Government	Mainly Government	Households/Private Sector
Technology Development	-	Government/Private Sector	Government/Private Sector
Latrine Maintenance	Households	Households	Households
Latrine Emptying	Government	Government	Households
Financing of Latrines	70% Government/ 30% Households	Government/ Households	Households

Target Population

3.13 As a very long-running pilot project which has still not graduated to the status of a fully-fledged national programme, the rural sanitation activities of councils have not yet clearly defined who are to be the beneficiaries. MLGL's planning of project activities for NDP7 and the existing councils' annual workplans suggest that the target population consists of all rural households which lack a toilet facility. Based on guidelines from the National Settlement Policy, 'rural' means any settlement outside of urban areas[6/] with a population which exceed 500 persons. According to this definition the Cost Analysis estimated a target population of 69,000 households in 1990, which would rise to 171,000 households by 2020 in the absence of the NRSP.

3.14 For the construction programme approach of Options 1 and 2 this

[6/] Urban areas are assumed to comprise Gaborone, Francistown, Lobatse, Selebi-Phikwe, Jwaneng, Mogoditshane and Orapa.

definition of the target population seems to be broadly suitable, since it focuses on those rural households who do not yet have any form of toilet facility. For Option 3, although this definition can be used as a partial indicator of the performance of the sanitation programme, the KAP study provides sound reasons for also including households which already have latrines:

- ***In households which possess a latrine the existing knowledge, attitudes and practices are often poor:*** regardless of whether the latrine type is VIP or non-VIP, people often use latrines improperly or fail to adopt other sanitation and hygiene-related types of behaviour which are needed to reduce the incidence of excreta-related diseases.

- ***Most existing latrines were built without government subisidies and without associated health education:*** the KAP study estimated that non-VIP latrines comprise roughly 86 percent of all pit latrines in Botswana. To achieve any significant reduction in the incidence of excreta-borne diseases it is therefore essential that health education should cover all rural households. There may also be a case for targeting specific measures to assist households to upgrade their existing non-VIP type latrines, so that these can be made more effective[7/];

3.15 In view of rapid demographic changes and changes in settlement patterns, it will be necessary from time to time to review the composition of the target population. The existing major villages will eventually become towns, subject to separate physical planning regulations and probably also with separate programmes covering sanitation. When they reach a population of more than 500 persons various small settlements will need to be included within the LG51 target population.

3.16 Another issue is whether the NRSP should cover households only or include other aspects of rural sanitation such as provision in schools and public places. Under Strategy Options 1 and 2 it would be simpler and more effective to exclude these other aspects; they will require different designs or technologies as well different delivery mechanisms. They are already provided under other national projects, including Primary Schools (LG114), Primary Health Facilities (LG104), Village Projects (LG109) and Village Infrastructure (LG149). On this basis a more accurate title for LG144 might be the 'Rural Villages Household Latrine Programme'. However, under Strategy

[7/] The KAP study found that among non-VIP latrines, 43 percent did not have a ventpipe and 87 percent did not have a flyscreen. If such latrines could be provided with ventpipes and flyscreens this would increase their effectiveness in controlling vector-borne diseases and odours.

Option 3 such a division between household latrines and a broader definition of public sanitation would become less appropriate. Since Government would not be substantially involved in latrine construction there would be no problems about different technologies and delivery mechanisms. Moreover, it can be expected that schools and public places will become an important focus for expanded health education activities. On the basis of Strategy Option 3, the project title should remain the 'National Rural Sanitation Programme'

3.17 The selection of communities to be assisted through LG144 is currently based on a combination of the sanitation needs which by council officials and the political demands of councillors. There is only a weak ranking of the actual needs of different settlements, and therefore settlements with lesser needs often receive a priority through the NRSP over those with greater needs. In some districts, political demands have meant that programme activities have been too widely spread across the district. Some councils spread their resources too thinly, leading to reduced effectiveness and higher costs. We suggest that each council should develop a priority ranking system which attaches greatest importance to actual needs and seeks where possible to assign programme resources between different geographical areas so as to maximise efficiency of implementation.

3.18 Although little work appears to have been done to identify the differences in environmental health risks in different types of settlement[8/], we consider it possible that these may often be closely related to population density and overall size of settlement. There would then be a strong case for concentrating NRSP resources on large and medium-sized villages. In fact, in some of the more remote settlements it is possible that lack of toilet facilities does not represent a major health (or pollution) hazard; this would suggest that such places can be excluded from the NRSP. An effort must be made to verify such assumptions. This might be achieved by reviewing existing health statistics, by conducting further analysis of the KAP study database, or by conducting further research into epidemiological aspects. Any decision to change the priority or eligibility of certain types of settlements would of course need to be approved at political level in order to ensure that this could be implemented by councils.

3.19 Existing data on latrine coverage in rural areas is inadequate. The Cost Analysis indicated that the outdated 1981 census is the only source of data on a nationwide basis. Officials have also expressed doubts about the accuracy of the 1981 results at the time they were obtained. Some councils have conducted baseline surveys of household sanitation facilities, but so

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8/ The KAP study indicated that diarrhoeal incidence may be slightly lower in small and very small villages, despite the fact that latrine coverage in such villages is significantly below that for medium and large villages.

far these have not covered more than a small proportion of the district population and have not been prepared according to a common format. Based on the 1981 census results and on rough estimates of coverage provided by council officials, the Cost Analysis assumed an overall coverage of around 30 percent. The KAP study, which was limited to a random sample of about 4,000 households, found that 42 percent of these households had their own toilet facility. Regardless of strategy option, MLGL needs to develop consistent baseline information about sanitation coverage in all districts and establish the means for periodically updating this information. MLGL should liaise with the Central Statistics Office to develop such baseline information on the basis of the forthcoming 1991 census.

Level of Coverage

3.20 A target level of coverage is needed to determine the scale of the NRSP. For Options 1 and 2 this may be best expressed as a proportion of the target population which it is planned should have within a finite period some form of on-site toilet facility, inclusive of both NRSP and non-NRSP latrines. The Cost Analysis indicated that MLGL and councils might support a target coverage of 60 percent. Based on the Cost Analysis, Strategy Option 1 would probably imply the construction of between 3,000 and 4,000 VIP latrines per annum over the next 30 years, at a annual cost to government of around P 5 million in 1990 constant prices. Under Strategy Option 2 a more affordable range of latrine technologies could reduce costs by as much as 50 percent, but the costs to government would still be substantial.

3.21 Assuming that under Strategy Option 3 there would be a significant shift of resources from construction activities to health education, the definition of a target level of coverage might need to be changed. Coverage might instead refer to the proportion of the target population which it is planned within a finite period should have acquired the knowledge, attitudes and practices to be able to determine and provide for their own needs for improved sanitation and environmental hygiene. By the time that around 60 percent of the rural population had achieved this level of health education, it might reasonably be assumed that this would create a major momentum for latrine construction by households.

Time Frame

3.22 The time to be taken for the NRSP to achieve its target level of coverage will depend on its approach, the number of households which lack adequate rural sanitation and the human and financial resources available to the NRSP. As has been shown in the Cost Analysis, a time frame of 20 years

would seem realistic for Option 1. Under Option 2 the introduction of better latrines might help to reduce the degree of difficulty associated with latrine provision. Through the introduction of cheaper technologies it would become easier for people to afford a latrine, and government subsidies could be spread over a larger number of latrines. Under such assumptions it is quite possible that latrine building could be significantly accelerated under Option 2, and that the time frame could be reduced to about 15 years.

3.23 By changing the emphasis towards health education and assigning more responsibility to households to finance their own latrines independently, some of the government budgetary constraints could be avoided, although there would be additional demands for skilled manpower. Assuming that the resources would be provided for health education, the time frame for 60 percent of the target population to have acquired satisfactory knowledge, attitudes and practices might be between 10 and 15 years.

3.24 Whatever time frame is adopted, it is clear that some outstanding issues will need to be resolved before the strategy can be implemented in full. It may be expected that much of the first three years of NDP7 will be needed for determining of the strategy, improving and refining the design of the NRSP and its approach to implementation, and establishing a transition from the existing to the new approach. Realistic predictions of the time frame for achieving long-term aims and objectives will only be possible towards the middle or later part of NDP7.

Choosing the Strategy

3.25 A clear set of aims and objectives needs to be agreed upon and endorsed at the political level. We have already made it clear that in terms of both effectiveness and sustainability we consider Strategy Option 3 should be chosen. Only this option attempts to directly improve peoples' knowledge, attitudes and practices, which are the key factors determining the demand for better sanitation. This option also provides for improvements in technology, and for greater involvement by private builders and suppliers, which are key steps towards establishing a reliable supply of affordable toilets. As shown below, although there are some risks attached to Option 3, these are expected to be less serious than those under Options 1 and 2.

Exhibit 3F: Aims, Objectives and Possible Outcomes

	Strategy Option 1 Existing Approach	*Strategy Option 2* Improved Technology	*Strategy Option 3* Overall Change of Emphasis
Aims and Objectives	Target Latrine Coverage	Target Latrine Coverage	Increased Public Interest in Better Environmental Sanitation
Means of Implementation	Council Latrine Building Programmes	Council Latrine Building Programmes	Council Health Education and Social Mobilisation Programmes
Primary Indicators	VIP Latrine Numbers Overall Latrine Coverage	VIP Latrine Numbers Overall Latrine Coverage	Incidence of Diahorreal Diseases Knowledge, Attitudes & Practices Sales of Approved Latrine Types Overall Latrine Coverage
Opportunities	Raise Latrine Coverage	Raise Latrine Coverage Improve Affordability	Raise Real Demand for Sanitation Reduce Dependency on Government Raise Latrine Coverage Improve Affordability
Threats	Weak Public Knowledge Deficient Technology Dependent on Government High Cost to Households High Cost To Government	Weak Public Knowledge Dependent on Government High Cost to Government Weak Technological R&D	Weak/Fragmented Health Education Poor Liaison with Private Sector Resistance to Subsidy Withdrawal

3.26 We recommend that future improvements in sanitation and environmental health should be achieved through Strategy Option 3. This will involve a transition period over the first half of NDP7. The following key changes are recommended:

- ***Increase and Improve Health Education Activities:*** only by generating a popular demand for improved sanitation facilities can the NRSP be sustainable. Rural people must be given the necessary information and guidance through health education and social mobilisation.

- ***Transfer Construction Responsibilities to Households:*** once popular demand has been established, more households will seek to provide their own toilet facilities. Government can then limit itself to providing demonstration latrines. The evidence that households can take on more of the financial responsibilities is that the majority of existing pit latrines were provided by households outside of the NRSP.

- ***Encourage the Supply of Latrines by the Private Sector:*** the programme has to date left no incentive for initiative by private

suppliers. Yet if the right conditions were created it would probably become both cost-efficient and commercially viable for private firms to supply approved latrine kits. along with simple installation instructions. Existing NRSP substructure construction activities by private contractors have demonstrated that the private sector can build latrines at lower cost than council direct labour. Private companies might also provide a compressor hire service for pit excavation on rocky ground.

- ***Develop a Government-Approved Range of Latrine Technologies for Supply by the Private Sector:*** this is a necessary safeguard against the risk of badly-designed toilet facilities. Government can also help to ensure that advantage is taken of technological innovations.

3.27 There is scope for a transfer of resources from construction to health education. In the extreme, if the entire government budget for latrine construction was transferred to health education this would be sufficient to meet the salaries of around 300 additional health educators at B2 grade. In practice, a much smaller number of health educators is needed for an effective approach to health education. After such a cadre has been at work for some years, government construction could be gradually phased out, with attendant savings in government capital and recurrent costs.

IV CONTEXT OF THE PROGRAMME

Identity of the Programme

4.1 Rural sanitation involves a somewhat confusing set of linkages and it overlaps with certain other policy areas. Responsibilities for rural sanitation activities are also divided between various different government institutions. As a matter of strategy these factors need to be reviewed and rationalised so that the identity of the NRSP can be clarified.

4.2 At the level of policy, rural sanitation is a component of the overall sanitation sector, its main aim is to improve health, and it may also be seen to encompass aspects of environmental protection and housing:

- ***Sanitation Policy:*** latrine provision is clearly a component of the overall sanitation sector, and within councils it must compete with other environmental sanitation acitivies such as waste disposal. But policy development in the sanitation sector as a whole has received little attention, and has been hampered by the absence of clear strategies and implementing guidelines[1/]. If the NRSP were to continue to be mainly a construction programme (Strategy Options 1 and 2), the sanitation sector might be the best policy setting for it. There might be a need to proceed with developing rural sanitation policies rather than wait for an overall sanitation policy to be prepared. However, if there is to be greater emphasis on health education and the overall aims are to improve public health (Strategy Option 3), then it would not fit so well within the sanitation sector alone.

- ***Primary Health Care Policy:*** health education about rural sanitation already forms part of MoH's primary health care strategy and is therefore a part of health policy. Under Strategy Option 3, the overall focus on improving public health through health education would mean an even stronger linkage with health policy.

- ***Environmental Protection Policy:*** latrine provision can also be seen as a measure to prevent water pollution. However, this aspect is not central to the aims, objectives or operating modalities of the NRSP. Moreover since non-VIP latrines are the majority of all latrines, the NRSP of itself cannot provide an effective instrument for controlling water pollution from latrines. Hence, despite some overlaps, rural sanitation and

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1/ 'Evaluation of the Village Water Programme' - Ahlberg, Drangert, Egner and Somolokae, 1988.

environmental protection are not the same thing. We understand that DWA plans to provide guidelines for prevention of water pollution in all parts of the country, which will serve as a useful input in determining the latrine technology options.

- ***Housing Policy:*** under Strategy Options 1 and 2 the existing project for latrine provision can also be viewed as supplying one part of the demand for housing in rural areas. According to NDP7 (p257), the objective of government housing policy is 'to ensure that every citizen has access to safe and sanitary housing...' The latrine is part of the house and can therefore be considered to fall under housing policy. For example, in SHHA housing development programmes, provision of a toilet facility is compulsory for participants and house and latrine are part and parcel of the same project. It is also true that a latrine is simply another form of housing asset: it is possible to have a house without a latrine but there is no point in a latrine on its own. Under Strategy Options 1 and 2 a latrine construction programme could be viewed as an integral part of housing policy, but under Strategy Option 3 there would be lesser linkage and the programme would move closer to primary health care.

The overall aim of the programme is to improve public health through improved sanitation and hygiene related practices. We consider that the NRSP has elements of sanitation, health and housing policy, and will be affected by future changes in all of these. The greater the emphasis on health education (as under Strategy Option 3), the more important is the health policy context. Overlaps with environmental protection and housing policy will have to be taken into account but are not at present the main context of the programme.

4.3 Adoption of a new rural sanitation strategy does not mean that existing efforts have been a failure or have to be brought to a halt in order to re-launch the programme on a completely different basis. Despite the shortcomings the existing project has achieved a great deal, especially in establishing a popular interest in sanitation in all districts. Even if a major shift of emphasis towards health education is adopted there will be a transition period; the introduction of change in the identity of the programme should be provided in clear, simple steps; and by re-orientating rather than replacing the existing implementation capacity of councils.

Responsibility for the Programme

4.4 During the study interview programme and the focus group sessions, we

assessed the way in which responsibilities are divided between the main public institutions involved in the NRSP. We concluded that for each of the three strategy options the overall responsibility for the NRSP should continue to rest with MLGL, that councils should continue to implement the NRSP and that MoH should provide the necessary professional and technical advice to MLGL and councils and guidelines about health education and health standards[2/]. MLGL should have overall responsibility since its existing portfolio covers sanitation, environmental health, housing and infrastructure. In view of the decision in 1988 to decentralise primary health care activities to the district councils, it would also not be appropriate for MoH to have overall charge of the programme, since it would not have control over the financial and manpower resources required for implementation. MoH would also have no control over the staff involved from councils' social welfare and community development departments.

4.5 As government's principal advisor on health matters, MoH should provide the expertise for the design of health education programmes, monitoring of health impacts and other health-related aspects. There may be duplication of effort and loss of coordination as MLGL and council health departments proceed to build up their own health education capacity and every effort should be made to keep MoH involved. Various other institutions need to be consulted and informed about overlap with other technical aspects, notably DWA in the case of water pollution, and DTRP for physical planning requirements. Under Strategy Option 3 the greater role for the private sector might necessitate some further links with institutions concerned with enterprise development, such as MCI, and others concerned with training, such as BRIDEC.

Exhibit 4A: Main Institutions Involved in the NRSP

Institution	Main Responsibilities Within NRSP
MLGL	Overall programme management, staffing and funding
Councils	Implementation
MoH	Technical and professional guidelines and standards
DWA	Advising on water pollution risks
DTRP	Physical planning

4.6 On this basis MLGL should continue to serve as the overall coordinator of the various ministries and departments which have some contribution to make. This coordination function should be strengthened.

2/ This conclusion is consistent with the findings of MoH's District Management Improvement Project.

4.7 MLGL has also been responsible for provision of public and institutional toilet facilities under LG109, Village Projects. It appears that these toilets are often not used properly; they are poorly maintained, and in some cases constitute a health hazard. Regardless of strategy option it is important that LG109 should take more account of the work being done in other aspects of rural sanitation. While LG109 is managed by council community development departments, health departments should be involved when sanitation activities are being planned under LG109. With increased health education in schools and public places under Strategy Option 3, there would be better prospects of people adopting improved sanitation and hygienic practices when using public and institutional toilets.

Policy Guidance and Leadership

4.8 Compared with many other countries Botswana has been slow to realise the importance of sanitation and to devise methods of improvement. Until now rural sanitation has lacked policy guidance and has not been promoted significantly by national politicians. As is reflected in the findings of this consultancy, there is consequently a backlog of policy issues which require attention. Particularly in view of the rapid development of towns and villages, the involvement of senior policy makers and opinion formers is now needed to provide policy guidance and leadership.

4.9 The strategy paper represents a first step in this process. Further steps should include:

- ***Workshop to sensitise key decision makers to the issues raised in the strategy paper:*** this should involve politicians, senior officials and local and international experts on sanitation and environmental hygiene. By publicising the proceedings in the local media, the workshop could be used to begin the process of raising public awareness.

- ***Seminars at district and national levels to debate the strategy paper:*** these would involve council secretaries and department heads, and would in due course lead to the strategy being endorsed by the National District Development Conference in 1992.

- ***Approval of an overall strategy by senior policy makers:*** strategic choices should be made and decisions should be taken at political level if the strategy is to reflect the intentions of the Government of Botswana. Options include approval as a national policy (or a part of one) by Parliament, a cabinet decision, or ministerial approval.

- ***Promotion of the strategy by politicians and community leaders:*** members of parliament, district councillors and community leaders are key to promoting implementation of the strategy at the local level. Any change in emphasis - such as a shift towards health education (Strategy Option 3) - must be put to these leaders with a request for their support.

4.10 A further option for providing guidance and leadership is to introduce legislation to require people to adopt particular sanitation standards. However, we expect that the process of preparing specific legislation for rural sanitation (or the overall sanitation sector) would take some years, and there would be problems of lack of enforcement capacity and will. There is some scope for taking advantage of other forthcoming legislation, notably the further application of town and regional planning regulations to cover the larger villages, which will probably require that all houses to be built on new plots must include provision of a toilet facility. In general we consider that legislation should only be used as an approach of last resort, since voluntary methods are often more effective, popular, free of enforcement problems and less costly to administer. It is probably premature to consider the need for specific national legislation on rural sanitation until much more health education has been provided.

Need for Integrated Approach

4.11 Although several different institutions are involved in rural sanitation activities, there is currently no permanent steering committee or coordinator to ensure an integrated approach. This provides a partial explanation for the poor cooperation between the NRSP and other MoH sanitation and hygiene education programmes. Part of the strategy should be to establish such arrangements, notably:

- ***A permanent steering committee:*** to provide a regular forum and a channel for advice to implementating agencies. To include representation from MLGL, MoH, MFDP, DWA and district councils.

- ***A position of primary health care coordinator in MLGL:*** this position has recently been proposed by MoH, in recognition of the major responsibilities of MLGL and councils for implementing primary health care and the need to draw on technical and professional advice from MoH. We envisage that day-to-day coordination of the rural sanitation responsibilities of different institutions could also be handled by this officer, who would also act as secretary of the steering committee on sanitation.

4.12 Some council health department staff have drawn attention to the poor cooperation they receive from other council departments, such as works and supplies, and have suggested that the health departments should be able to This proposal implies a wasteful duplication of roles which councils can ill afford. With a more integrated approach and an approved overall strategy, such problems will probably diminish. They would disappear under Strategy Option 3, since councils would concentrate on health education and leave responsibility for latrine construction to householders and the private sector.

Significance of Physical Planning Aspects

4.13 The physical planning section of this strategy paper takes into account experience gained from the planning of infrastructural upgrading in rural villages. Knowledge of the constraints in different village areas and setbacks to be expected in certain environmental conditions have a bearing on the feasibility of the programme.

4.14 Domestic sanitation in urban areas is installed as part of the housing programme in a well defined and coordinated development project, where all infrastructural components (roads, drainage, water, power, street-lighting etc.) are standardised and documented in agreed urban standard recommendations. Engineering aspects of the implementation feasibility are in hand at an early stage and such constraints as topography, soils, existing development etc., are known and will be reflected in the planning of the development area. A development plan (master plan or structure plan) is the broad overall concept for detailed layouts; this is used as base for detailed engineering prior to implementation.

4.15 Upgrading of infrastructure in urban areas follows a similar concept of in-depth surveys and planning prior to any implementation activities, as for instance in Old Naledi in Gaborone and Peleng in Lobatse. The provision of sanitation for such areas has been an intregral component of the infrastructure provision activities which has been well studied and analysed for the specific area and whose financial as well as environmental consequences are known.

4.16 New development areas in major villages will follow this urban model once the Accelerated Land Servicing for rural areas is a fully approved concept. This might take some time still until the financial consequences of such a programme are known in detail. The planning for new development areas in major villages has however already adopted this 'urban' infrastructure concept and we assume that the provision of sanitation in new

planned extensions in major villages will for the future be part of the implementation of such projects.

4.17 For existing rural projects the upgrading of infrastructure (including sanitation) is seldom undertaken in accordance with comprehensive physical planning principles. It is mostly done in an ad-hoc manner and as a sector programme. The end result is that most roads, drains power lines etc., perhaps even sanitation, are likely to have only a short-term lifespan which will have to be changed when more comprehensive physical planning is introduced.

Physical Planning Conditions and Constraints

4.18 The implementation of a sanitation programme will depend on such conditions as the amount of space made available on plots and the accessibility of plots for construction and maintenance

4.19 Botswana villages began with exclusively traditional patterns of settlement. They have now evolved into fcommunities exhibiting changed land administration systems, new building technologies and increasingly modern and sophisticated infrastructure. This has resulted in a special mix of structure types, each with its own set of difficulties for any upgrading programme, and often these types are found simultaneously in the same settlement. We describe below some of the identifiable different structures, with examples taken from recent maps for illustrative purposes (please refer to Exhibits 4B to 4G at the end of this chapter):

(a) Traditional Patlelo-based Pattern

Exhibit 4B shows the traditional patlelo-based village structure to be found at the core of most large Tswana villages. This example is taken from Kanye. Here we notice:

- the semicircular pattern of many grouped plots around a semi-private open space (patlelo). The groups at times back directly onto one another, at times face each other. In some cases, circumstances have directed a stretched-out, almost linear pattern. Within the clusters most plots have shared boundaries but boundaries are not always demarcated. Individual plots are often rather small and crowded with existing buildings.

- that there are also free-standing residential plots (often small), including some that appear to have no distinct physically defined yard (lolwapa) around them.

- that there are generally several buildings per plot, giving a fairly high density. Traditional homes incorporate open space as an integral part of the living space, eg the kitchen is frequently out-of-doors. So plots are intensively utilised.

- the fairly abundant open space. Some of this functions as semi-private areas, enclosed by a semi-circle of plots. Such patlelos provide the opportunity for social gatherings, childrens' playgrounds, parking for visitors etc., in areas secure from traffic hazards. The usual pattern of neighbouring relations within the grouped plots also provides opportunities to foster open space management by adjacent residents. For the rest, there is no organisation, and traffic makes its own way through these areas. Some of the open space might look like 'leftovers' but may be subject to land claims since pre-land board times, so it cannot be automatically assumed that all of it is available for new uses.

- the general lack of well defined road routes and a rational road network. Vehicular access to some plots is difficult, sometimes impossible for larger trucks and tankers.

Problems that a sanitation delivery programme will encounter in a settlement of this type include:

- plots which have not been physically defined have to be demarcated by the local land board, a procedure that will have to be completed before construction begins and hence could delay implementation.

- the high density of buildings on plots will constitute a serious constraint for the siting of sanitation facilities in accordance to regulations. It should be noted that many major villages will be declared planning areas within the near future and, thus, the Town and Country Planning Act and the Development Control Code will apply[3/]. Basing a sanitation programme on the assumption that waivers and exemptions will be freely granted where there is overcrowding could nullify the entire physical planning exercise and give rise to results detrimental to the programme's contribution to public health.

- as it will not be possible to reach all plots by roads suitable to construction trucks and maintenance vehicles of existing

3/ Requirements for siting and access for sanitary installations are covered under Section 1.2.8 of the Development Control Code (1991 revision).

types, either the sanitation unit has to be built outside the boundaries of these problem plots or the plots will have to be left out of the programme.

(b) Maun Traditional Pattern

Exhibit 4C shows a densely built-up area in the centre of Maun; we can be fairly certain that this type of settlement pattern, which exists elsewhere in Botswana, will present a sanitation programme with some specific implementation problems.

The interesting feature in this case is the lack of common plot boundaries. It is impossible to determine what is private and what is public land. There will be a need for demarcation and mapping of plot boundaries as part of any upgrading exercise. Any such exercise can further delay implementation since whenever disputes arise they will require more time-consuming adjudication.

This is why in Maun the possibility of a total re-zoning and resettlement of many of the residents is being discussed; this is a good indicator that a sanitation programme must be planned in close consultation with local authorities.

It will also be noted that in areas like this one, a pattern of mixed land use is fairly common. Many small shops exist within residential areas, in spite of the presence of more concentrated commercial areas nearby. This is incidentally very common in all types of rural settlements. This could constitute a problem for a sanitation programme, addressing itself towards the <u>domestic</u> sector.

(c) Early Land Board Pattern

Exhibit 4D is taken from Palapye but is probably representative of most villages in the country. It illustrates the early attemps by land boards to bring an orderly system to land allocation. The intention was to avoid 'wasting' land as open space, by allocating more rectangular plots in straight lines.

Unfortunately, too little space was provided for road reserves; many plots are inaccessible to construction and maintenance trucks. No semi-private open spaces have been set aside, so this solution is not available for sanitation units outside the inaccessible plots.

Fortunately, however, these areas will not create other problems, at least so long as the soils allow for digging of pits. The plots are generally large and allow more than one option for the siting of a

sanitation unit.

(d) Planned Allocation Pattern

In the 1970s some land boards began to make deliberate attempts to control village expansion by demarcating and allocating plots in accordance with planned layouts. An example of this work is shown in Exhibit 4E, also taken from Maun (Botshabelo).

In this area provision was made for roads with standard reserve widths. One can see, however, that the demarcated plots have not been adhered to completely, which suggests some misunderstanding or deliberate alteration.

Although we do not foresee any major problems in implementing a sanitation programme in similar areas, it should be pointed out that sanitation units ought never to be accepted on 'illegal' or self-allocated land. Thus, we again stress that a sanitation programme will need much development control.

Settlement Structure Comparisons and Future Trends

4.20 The physical layout of residential plots in villages changed radically in the 1970s following the passing of the Tribal Land Act (1968) and the constitution of land boards. The earlier pattern is illustrated in Exhibit 4F and the latter pattern is shown in Exhibit 4G. Obvious differences which have a bearing on sanitation include:

- ***Size of plots.*** Modern plots tend to be much larger than the old ones, in spite of more recent moves to cut down plot sizes. The present standard is 30m x 40m in some districts, 40m x 40m in others. Siting and construction of pit latrines are rendered easier in modern areas but the size of the plots and the distance between houses will make introduction of waterborne sanitation (as well as upgrading of other infrastructure components) extremely expensive.

- ***Plot boundaries.*** The individual plots within the traditional horseshoe grouping shared common fences or hedges. The trend now is that plots are often separated from each other by passageways of varying widths. This means that discussion of shared facilities, wall-to-wall construction etc., is virtually impossible for some 'modern' areas.

- ***Plot development.*** Traditional plots generally show higher densities of buildings than more modern plots. This may reflect an age factor and modern buildings combine many different uses where traditionally each domestic function has its own building. The small, crowded plots in traditional areas will clearly create problems for a sanitation programme.

Future Trends in Physical Planning

4.21 There are some trends which are already treated as parameters in planning residential extensions in major villages; and which will have consequences for a sanitation programme. These include:

- ***Smaller plots.*** The suggested interim plot size is 1,000 square metres and it is expected that the Accelerated Land Servicing Programme for rural areas will ultimately be based on plots of at most 800 square metres (the plot sizes for low income plots in urban areas were reduced from 450 square metres to 375 square metres under the ALSP programme).

- ***Serviced plots.*** The intention is to plan new areas for a higher level of servicing. Today's fundamental differences between villages and urban areas will be less pronounced in the future. Engineered infrastructure and surveyed plots will be made available even in major villages. The services will be offered on a cost-recovery basis, which will encourage the occupants to restrict plot sizes in order to save their own money. They have no such incentive at present.

- ***Housing programmes.*** Government's housing policy encourages introduction of a modified version of the urban self-help housing programmes in the rural areas (draft NDP7, p257). Waterborne sanitation is envisaged for future expansion areas in major villages and obviously will be part of housing programmes, rather than sectoral programmes.

- ***Upgrading programmes.*** Existing areas in (initially) major villages will be subject to planned and coordinated upgrading activities in accordance with the recently presented Village Upgrading Programme and Village Upgrading Guidelines. It is consequently necessary to formulate the NRSP in the context of the overall upgrading programmes.

  Sectoral programmes such as Village Water Supply have already had an impact on conditions in villages. Many more households now

have individual water connections on the plot, a fact that was hardly anticipated when VIP latrines were introduced.

- ***Sludge disposal.*** It is necessary to identify sites for future waste and sludge disposal. In the past domestic waste was sometimes disposed of in pits near homes, if at all. Modern dependency on ready-made consumables has forced councils to start organised garbage collection services. The increasing number of septic tanks to be regularly emptied has also become a burden on councils.

  Waste and sludge disposal sites have to be identified 500 to 800 metres away from existing or planned development. The sites must be fenced and the location acceptable in respect of groundwater conservation.

  With sharp increases in the number of toilets to be emptied regularly, existing sludge disposal sites may become too small or their location may become unsuitable. Identification of sludge disposal sites must be addressed by a future sanitation programme.

Implications of Physical Planning Aspects for Strategy Options

4.22 In our discussion of physical planning aspects we have indicated some problems that a sanitation programme will meet. To assess the extent of these problems (eg number of 'problem' plots), pilot projects will be needed to specifically address these issues. In the meantime, it is clear that the sanitation strategy must take account of the existence of these problem areas.

4.23 Physical planning measures will affect the approach to sanitation provision, particularly in primary centres and those larger villages where population density is high. To cope with future changes the NRSP will need to operate within the framework of the National Settlement Policy in close liaison with the authorities responsible for land allocation, physical planning, housing and infrastructure development. Since it can be generally predicted that sanitation will become increasingly subject to planning controls, it may be expected that the present construction programme approach (Strategy Options 1 and 2) will become increasingly out of step with overall policy in many cases, and increasingly difficult to implement in others:

- in future there will be increasing demand for full integration of the NRSP with housing programes and integrated infrastructure programmes; thus the tendency will be either to absorb sanitation

provision within larger overall physical developments; or to include it as a mandatory component of all new housing units; and probably also to require approved standards of sanitation to be complied with by law.

- many villages suffer from problems of plot accessibility which are likely to prevent latrine empyting being carried out using some form of vacuum tanker. Since this problem will affect other services eg garbage removal, fire, police, the longer-term solution is likely to be in the form of 'upgrading' and reduction in plot densities. The need for long-range physical planning is well illustrated here, since it would obviously be unwise to encourage expenditure in permanent sanitation facilities in areas scheduled for upgrading.

- with the growth and trend towards urban standards in larger villages, it is to be expected that waterborne sanitation will be extended to cover larger areas; the NRSP must take account of the likely timing of such changes and try to develop technological options which permit upgrading from rural to waterborne standards.

Exhibit 4B: Traditional Patlelo-based Settlement Pattern, Kanye

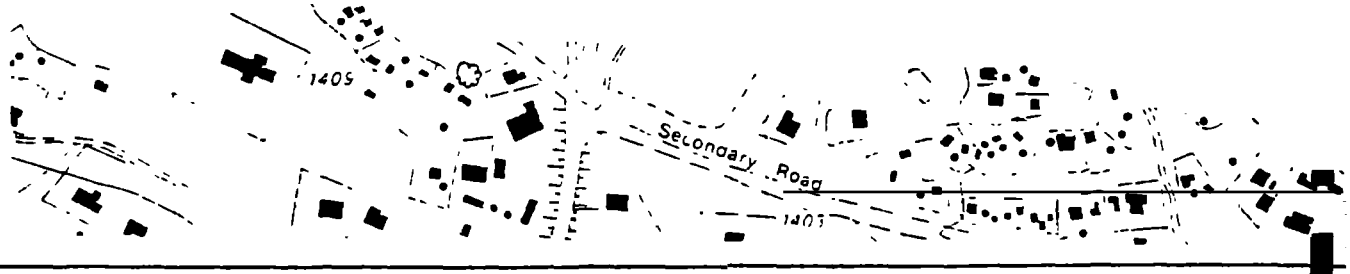


Exhibit 4C: Traditional Settlement Pattern, Maun

Exhibit 4D: Early Land Board Settlement Pattern, Palapye

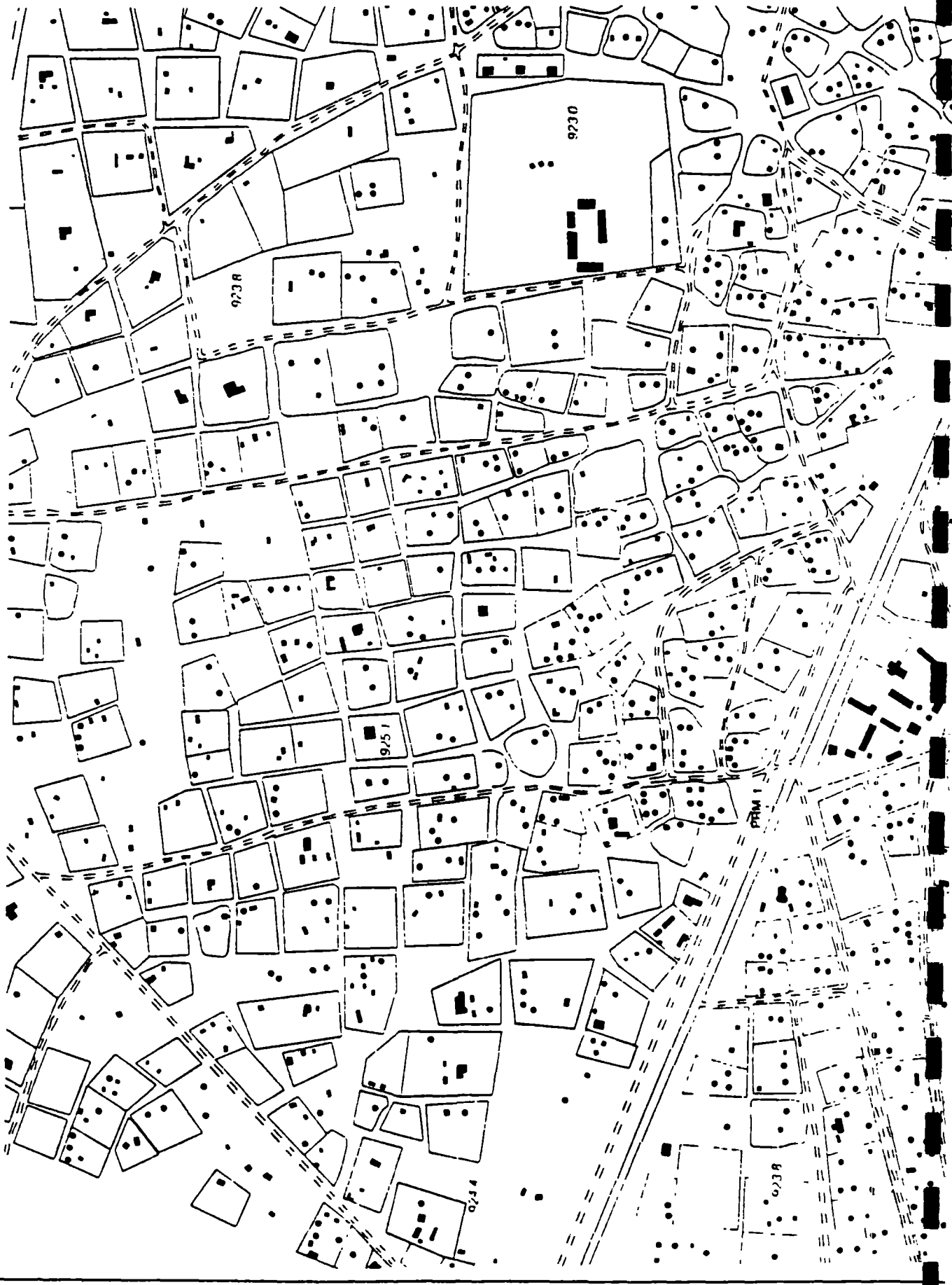


Exhibit 4E: Planned Allocation Settlement Pattern, Maun (Botshabelo)

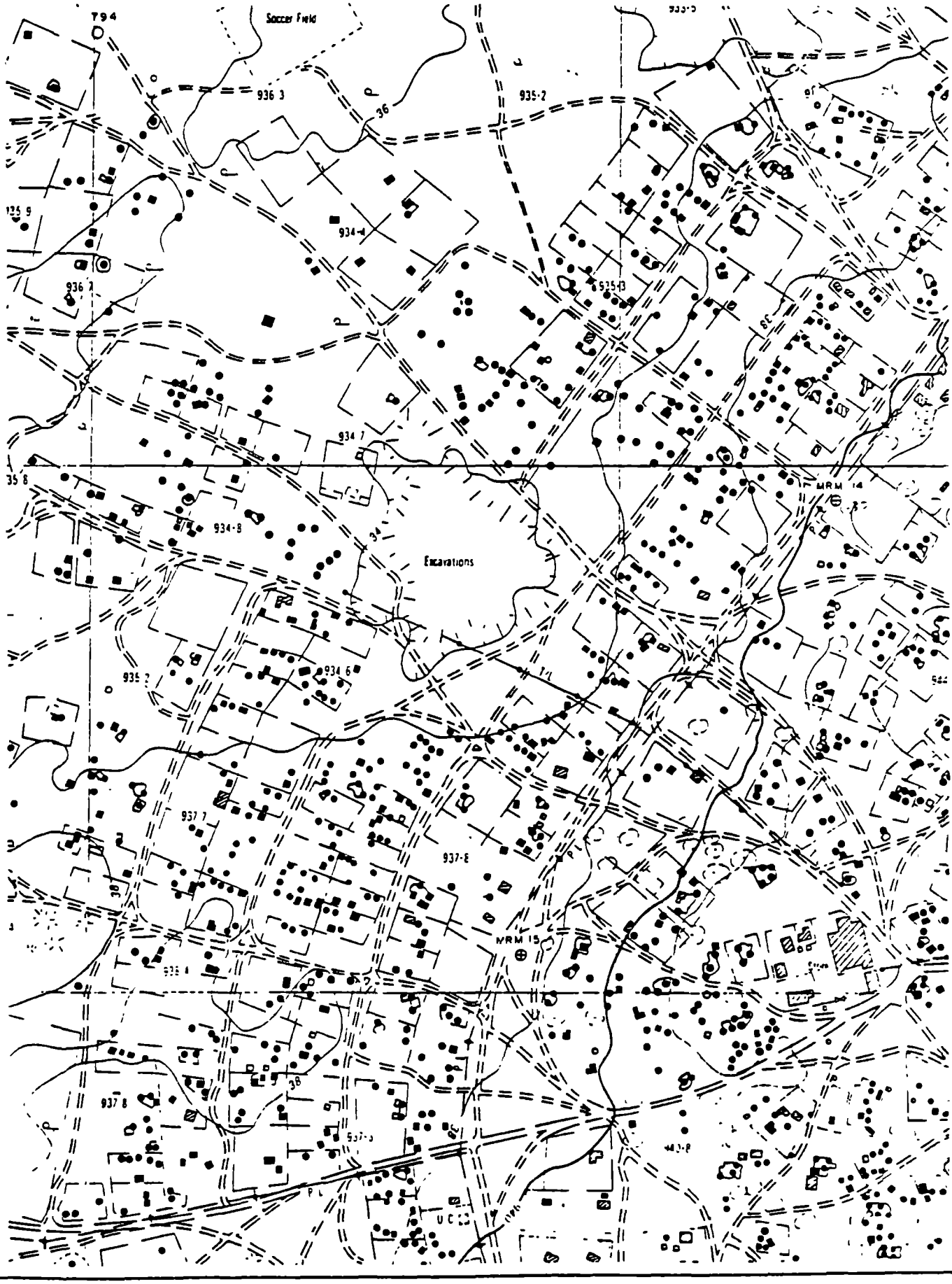


Exhibit 4F: Example of Residential Layout before Tribal Land Act

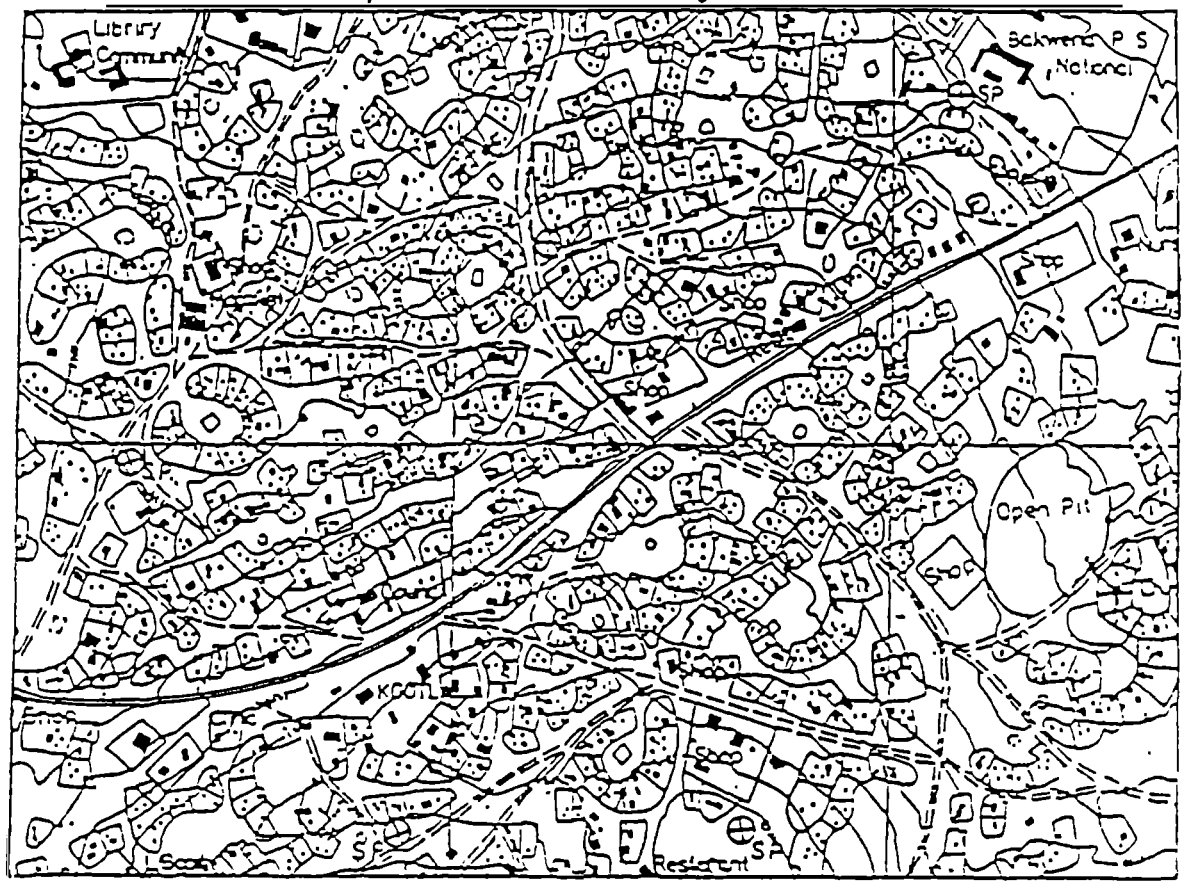
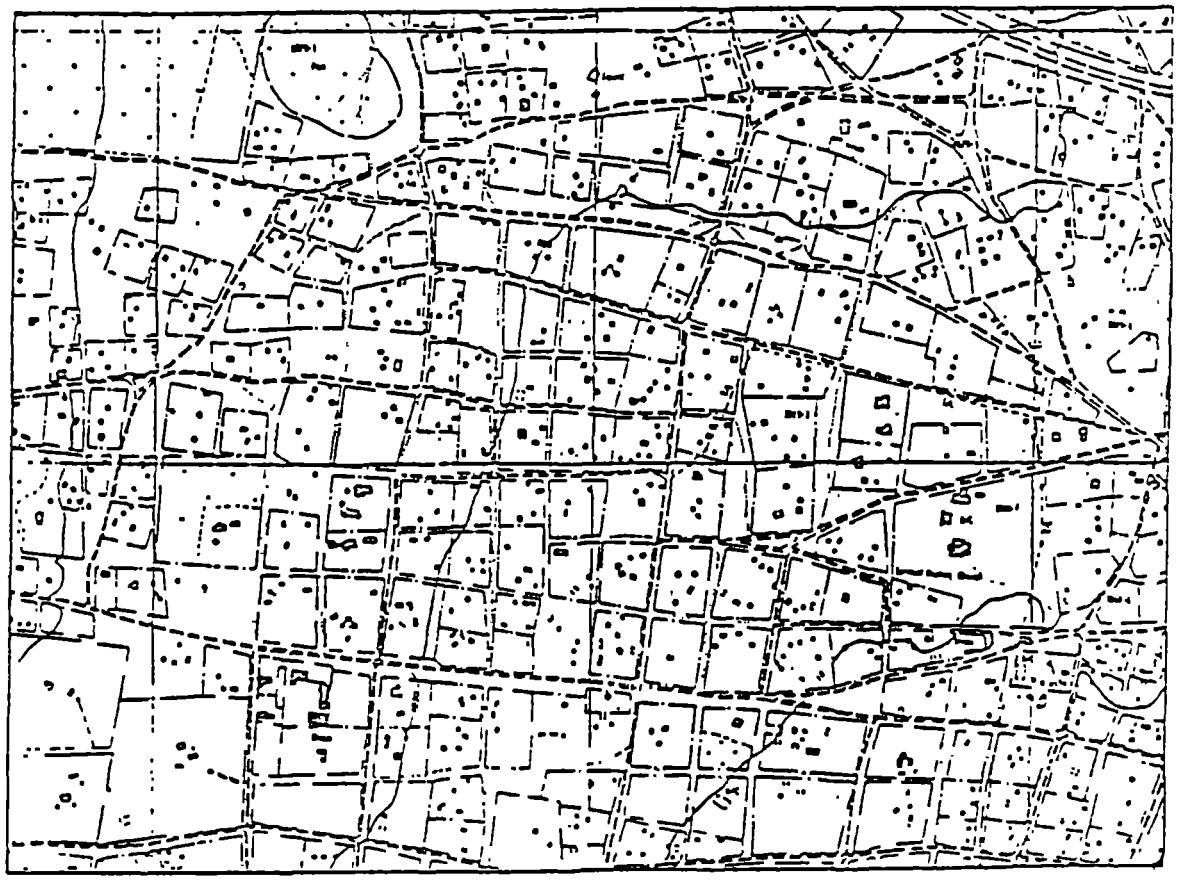


Exhibit 4G: Example of Residential Layout after Tribal Land Act Pattern



V THE TECHNOLOGY

Background to Existing Technology

5.1 The existing latrine technology is based on the concept of a pit latrine consisting of a hole excavated in the ground, a covering slab and some form of superstructure designed for shelter and privacy. Because of the odour and fly nuisance associated with the basic pit latrine, improvements were developed by the Blair Research Laboratory in Zimbabwe to produce the Ventilated Improved Pit (VIP) latrine which is odourless and minimises fly problems.

5.2 The Botswana VIP latrine (BOTVIP) is an adaptation of the Blair VIP latrine. This was first introduced in Botswana in 1976 through the Urban Low-Cost Sanitation Research project funded by the International Development and Research Council (IDRC). The most important improvement was the installation of a ventpipe and flyscreen to create an air flow or draft out of the pit to expel the odours and discourage fly breeding, thereby enhancing cleanliness and providing more hygienic conditions.

5.3 In order to formalise the construction of the BOTVIP latrines, certain design principles were established by MLGL, to try to ensure that the basic philosophy of providing a low-cost, hygienic and relatively sophisticated form of sanitation was adhered to.

5.4 Five basic design principles were intended to ensure correct construction, operation and maintenance:

(a) ***Long life.*** The volume of the pit and the integrity of the construction materials should provide for a long-lasting latrine.

(b) ***Ventilation and Insect Control.*** Design of the pit and its ancillary components should eliminate offensive odours and control the movement of flies and other insects to and from the pit.

(c) ***Safety.*** Design should ensure both structural stability to avoid the risk of collapse, and user safety to eliminate the risk of children falling into the pit.

(d) ***Self-Help Construction.*** Latrines should be affordable to their users, and design should aim to incorporate materials materials and techniques (including traditional types) with which rural builders are familar.

(e) ***Ease of Maintenance.*** Design must allow either access to the pit for emptying or relocation of the latrine when the pit is full.

For ease of reference the different components of the BOTVIP latrine are illustrated in Exhibit 5A.

5.5 Our field inspections of existing latrine construction show that the principles of long life and low-cost are being compromised. The building materials being used are capable of ensuring a long-lasting structural life but the volume of the pit is too small and the pit will fill up in a fairly short time. Thus relatively high-cost latrines are being built with the intention that they will last for many years but due to capacity limitations the intended lifespan will not be realised.

Assessment of Substructure

5.6 The substructure is the most crucial component of a latrine and it is currently also the costliest. It is crucial in the sense that the substructure determines the latrine's capacity, stability and permeability, and all these factors have to be addressed.

5.7 The original concept of the BOTVIP latrine allowed several main options for substructure construction. The choice of option was governed by the type of soil encountered. The options can be broadly categorised as follows:

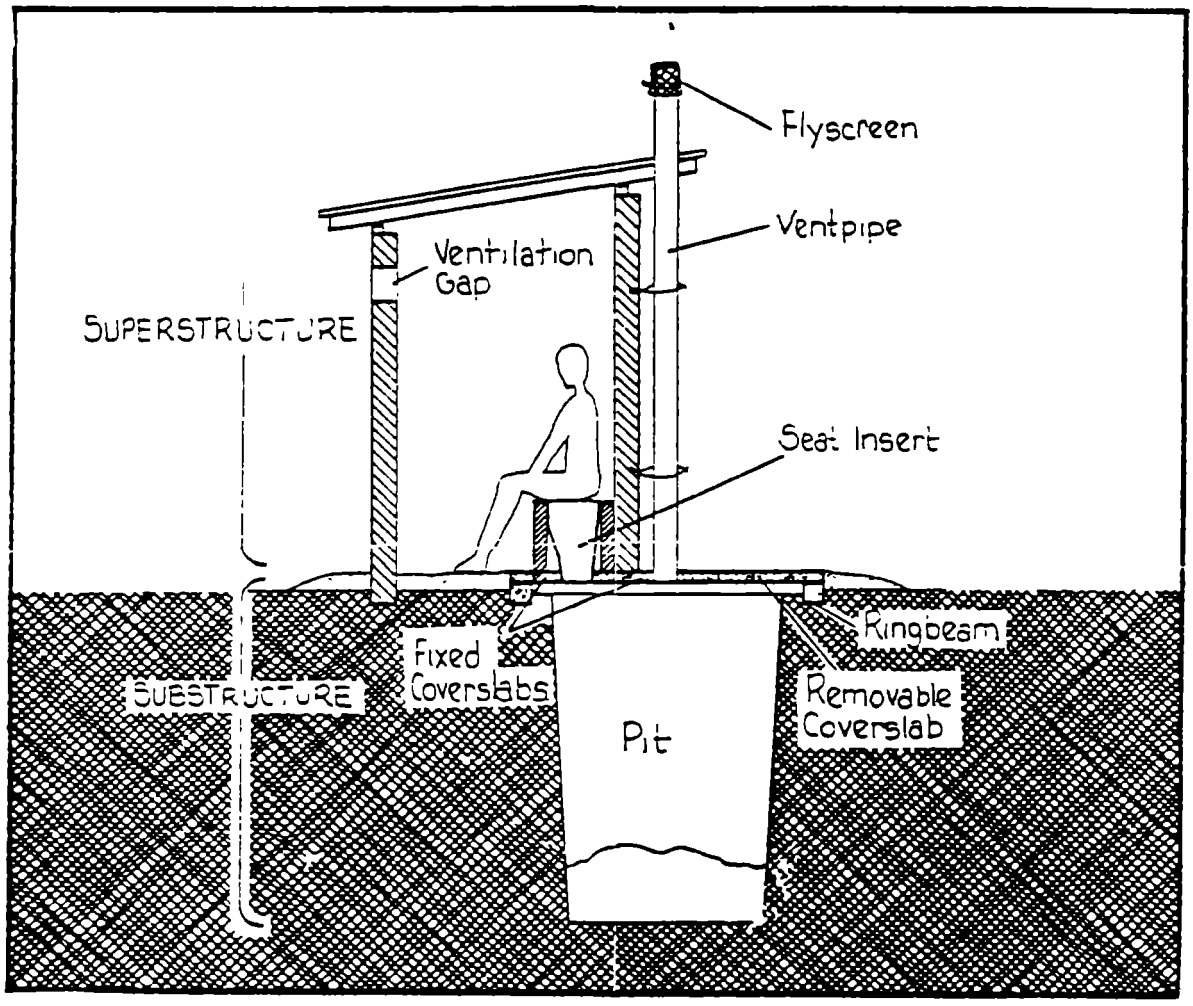
(a) Rectangular unlined pit suitable for use in stable soils such as heavy clay or rock;

(b) Circular lined pit suitable for use in unstable soils such as sand, sandy clay or loose clay, lined with either masonry blocks or wire mesh and filter fabric.

The decision as to which option to use is normally left to the Village Sanitation Coordinator.

5.8 The original unlined pit had a minimum capacity of 1.6 cubic metres, with dimensions of 0.6 metres width, 1.3 metres length and a minimum depth of two metres. The circular lined pit also had a capacity in the region of 1.6 cubic metres, with dimensions of 0.9 metres in diameter and between two and three metres in depth.

Exhibit 5A: The BOTVIP Latrine



5.9 In June 1988, MLGL refined the original concept by producing drawings of the LG LAT series. These effectively selected the single option of a rectangular lined pit with internal dimensions of 0.9 metres wide, 1.2 metres long and 1.6 metres deep, and a capacity of 1.7 cubic metres. There was a design option for areas of rocky ground which reduced the amount of excavation in hard material by raising the upper part of the substructure above ground level (see drawing number LG LAT 01C in Annex C).

5.10 During our field inspections we observed that, in accordance with the revised drawings, rectangular lined pits were being constructed irrespective of the ground conditions being encountered. It was also observed that the quality of the building materials and workmanship was excellent, which suggests that pits are being built with the aim of providing latrines capable of having an extended life. This investment in a long-lasting substructure implies that the pit is expected to remain in use in its original position and that it is not expected that it will be necessary to construct a further pit of this quality for a very long time.

Assessment of Superstructure

5.11 While the superstructure must comply with the original design principles in terms of ventilation and hygiene, the household has substantial discretion regarding the type of superstructure, which can be made of brick, block or other material. MLGL drawings show a plastered cement blockwork structure, but some householders have used galvanised iron or other more readily available materials. Of the superstructures inspected, the end result, irrespective of materials used has been pleasant, clean and generally acceptable. While the KAP study has identified problems regarding cleanliness and hygiene in latrines, these arise out of inadequate user practices and are not due to bad design.

5.12 Our attention has been drawn to the fact that most households use blocks or bricks for superstructure construction, which significantly raises the cost compared with a superstructure using traditional building materials. This may have arisen partly because MLGL drawings and promotional material generally feature blocks or bricks. Additionally, a social stigma may attach to the use of cheaper techniques. There is scope for lowering costs by promoting superstructure construction using traditional techniques.

Assessment of Latrine Emptying

5.13 The original Blair latrine was substantially deeper than the BOTVIP and had so large a capacity that emptying was not required. The effective pit volume was around three cubic metres, which would provide a useable lifespan of about 20 years for a family of six. For the same family using a BOTVIP the anticipated lifespan of the latrine is only 7 years. While there was no need to include a means of emptying in the design concept for the Blair latrine, the lifespan of the BOTVIP is critically dependent on the identification of some means of emptying. However, we are not aware of any effective means of emptying BOTVIP latrines other than the difficult, sometimes hazardous and largely culturally unacceptable method of emptying by manual labour.

5.14 It is evidently necessary to resolve the issue of the disposal of pit contents. MLGL and councils have envisaged that pit emptying can be carried out by vacuum tanker, but we consider that this philosophy is unsound for a number of reasons:

- it encourages people to reject the idea of emptying by manual labour since the service has to date been provided virtually free of charge;
- in rural areas there is no ready access to a vacuum tanker;
- it has been proven that the conventional tanker in council service does not have the power to evacuate the dry contents of the pit;
- whereas the contents of the pit have been deliberately dehydrated over its lifespan, water now has to be poured into the pit and the contents stirred in order to assist the vacuum tanker;
- in practice only a small percentage of the contents are being evacuated;
- solid waste, builders rubble and a variety of other objects are being dumped into pits, thereby preventing effective tanker operation, and in some cases causing damage to the vacuum equipment;
- even if vacuum tankers could be used, this approach to emptying is prohibitively expensive; it commits councils to substantial recurrent expenditures for tanker operations and maintenance[1/],

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1/ See Cost Analysis study.

and would perpetuate the dependency of households on government provision.

5.15 In urban areas, where there are often many people living on the same plot, the problem is compounded because the capacity of the latrine is often reached much more quickly (in some cases, in months) resulting in vacuum tankers having to evacuate fresh pit contents with a resultant offensive odour nuisance.

5.16 While the design of the pit latrine can be adapted to become less costly and to provide greater capacity in order to enhance lifespan, the problem remains of how to empty them. If this problem is not resolved the extra resources used to provide a long-lasting substructure will be wasted. Without an effective approach to emptying, existing pits will become unusable. Councils will then come under pressure from latrine owners either to try to empty them with existing limited equipment or to construct new (subsidised) pits on existing plots.

Design Criteria for Technology Improvements

5.17 It is reasonable that the design criteria for improving the latrine technology should be based on reasserting the original five basic design principles (see above), and refining them in the light of ten years operational experience. It is obvious also that much more attention needs to be given to the cost of construction. The existing interpretation of social and cultural factors as ruling out the use of manual labour for latrine emptying indicates that more attention must be given to cost-recovery, since if people had to pay the full cost of emptying by vacuum tanker they might well change their minds about manual methods. At the same time, there is scope through health education to overcome some public prejudices against particular types of technology.

5.18 One of the most important aspects in the technology which seems requires attention is that of providing a truly low-cost facility for on-site sanitation. The latrine must be affordable to the user and it must also minimise recurrent costs. Within the concept of the VIP latrine the way to achieve both of these aims is by increasing the substructure capacity and lowering or maintaining the cost of construction. There could however also be other types of latrines and low-cost toilet technologies which might offer more radical solutions that would be both easier and cheaper than the VIP design, which will never be a truly low-cost facility and will therefore remain unaffordable for many rural households in the absence of unacceptably high levels of subsidy.

5.19 In our view no single technology can be expected to satisfy all rural sanitation requirements. We therefore recommend that a range of technology options should be developed. We have identified a need for three distinct options:

- ***Low-cost.*** Designed mainly for use in more remote villages, and to provide an affordable option to assist low-income households and other vulnerable groups. We do not consider it likely that this option can be developed by modifying the BOTVIP design.

- ***Standard type.*** This would be designed mainly for small and medium sized rural villages. This might be based on modification of the BOTVIP, in the event that existing limitations regarding high cost and latrine emptying can be overcome to a substantial extent.

- ***Upgradeable type.*** This would be targeted specifically for use in major villages and towns, where it is now necessary to anticipate the transition to mandatory standards of household sanitation and an eventual shift to water-borne systems. Blair Research Laboratory has already conducted some work on developing an upgradeable VIP latrine, which might offer insights into what would be appropriate for Botswana.

5.20 In designing a range of technology options it will be essential to take full account of geographical, demographic and socio-economic conditions which determine the setting in which sanitation facilities are to be provided and used. There is a need to obtain guidance from DWA on which parts of the country will require pit-lining to prevent water pollution and which parts will not. In refining the upgradeable option there is a need to ascertain what future standards are planned for larger villages. Above all, the designs must lower the cost of excavation and construction of the substructure. In this connection there would be merit in seeking the opinions of small and medium sized contractors who have been involved in latrine building and who may be able to offer important insights into how the costs can be reduced.

5.21 By reasserting the fundamental principles of the original design and reappraising the methods of achieving these principles, a more cost-effective range of latrine technologies can be achieved. This process can be assisted by drawing on the experiences and technologies used in other countries. A variety of different latrine types is currently in use in Zimbabwe, Malawi, Lesotho and South Africa.

Scope for Improving Existing Design

5.22 The concept of the single pit latrine is generally accepted as the main sanitation technology for use in rural Botswana but, as we have mentioned, the single pit cannot be regarded as the universal answer in all conditions.

5.23 The weakness of the existing design is not in the concept but that it costs too much and is usable for only a fairly short lifespan. The design of the current types of latrine can only be improved upon in a limited way before the small pit fills up and it has to be abandoned. We doubt that the existing design can be modified to provide a truely low-cost option.

Other Technology Options

5.24 The design of a range of technology options should attach particular attention to the stability of the substructure. In general, poor soil conditions predominate in the remoter areas, where a low-cost solution is generally required; and rocky conditions seem to exist in most semi-urban areas and major village locations.

5.25 Although this is a simplistic approach it relates directly to depth and capacity of the pit. Deep pits in sandy conditions require some form of lining, and a circular section is the most economic and structurally stable. In rocky areas, wide shallow double vault pits may be more appropriate, either lined or unlined depending on stability, affordability and risk of water pollution.

5.26 There is scope for introducing more radical changes in the technology, such as building substructures which extend well above ground-level, or providing removable superstructures (and possibly coverslabs) for use with short-life pits. It is therefore important that research and development efforts should not be restricted to developing solutions to the problems of the BOTVIP. And it should not be forgotten that the present widespread rejection of manual emptying of pits could change rapidly if full cost-recovery were to be introduced for emptying by other means.

5.27 To improve the technology it will be essential to create a national capacity for research and development into sanitation technologies. We suggest that such capacity should be established in an existing institution concerned with technology development, such as BTC or RIIC. However, we recommend that the main research and development effort should aim to draw from the considerable experience of other countries. It is better wherever possible to develop technology through adoption and adaptation of existing technologies. This is likely to be cheaper, faster and more effective than

attempting to originate completely new designs.

Implications for Strategy Options

5.28 Our review has shown that the existing BOTVIP technology is inadequate and cannot be expected to provide an effective means of meeting national needs for improved rural sanitation. For the overall strategy to be successful, it must therefore encompass the development of better, cheaper technology which should eventually supersede the BOTVIP latrine. Thus, Strategy Option 1 (the existing approach) cannot succeed because it is based upon inadequate technology. Participation by households can only be secured through high levels of subsidy, and will fall sharply when people discover that the latrines cannot be emptied and they are required to pay the full costs of replacement. Strategy Option 2 (existing approach with improved technology) and Strategy Option 3 (health education emphasis with improved technology) are therefore clearly preferred. Strategy Option 3 has important advantages over Strategy Option 2, since it also seeks to ensure that the technology will be used properly, and that households will adopt the better sanitation and hygiene practices which are crucial for improving health.

VI AFFORDABILITY AND SUBSIDIES

Affordability

6.1 Existing VIP latrines are expensive. According to the Cost Analysis, the average cost per latrine in 1990 was about P 1,650. While accurate information about rural household incomes is not available, it is evident that many households annot afford to meet cost without government subsidies[1/], and many more would prefer to spend their disposable incomes on something other than a VIP latrine.

6.2 Government subsidies cover on average around P 1,200 (70 percent) of the total provision cost and households meet about P 450. The lower-income households which cannot afford P 450 are therefore effectively excluded from the NRSP.

6.3 The Cost Analysis found that a VIP latrine costs around P 2,500 in the more remote Ghanzi, Kgalagadi and North West districts, where the estimated household contribution is around P 750. Obviously an even larger proportion of people cannot afford to participate in these districts.

6.4 Until now it has generally been assumed that the VIP latrine is emptyable and that the high cost of construction could be justified by its extended life of more than 20 years. As we have explained in Chapter V, VIP latrines are not in fact emptyable. Their average working life may be only five to eight years, before they become full. This implies that annualised provision costs inclusive of latrine replacements may be between three and four times those originally envisaged.

Exhibit 6A: Estimated Annualised Latrine Provision Costs[2/]

	Annualised Unit Provision Costs (Pula, 1990 prices)		
If Emptyable	Paid by Government	Paid by Households	Total
Emptyable	60	23	93
Not Emptyable	200	75	275

6.5 For the existing construction programme approach (Strategy Option 1), the high cost of VIP latrines means that any significant reduction in subsidy

[1/] For example, the KAP study indicated that half of rural households are headed by females, whose earning capacity is usually less than half that of males.

[2/] Assuming that VIP latrines have a life of 20 years if emptyable and 6 years if not emptyable.

levels can be expected to lead to a reduction in public participation (although many would continue to build non-VIP latrines, as they do at present). Since growth in national and household incomes is expected to slow down under NDP7, there are no prospects of this approach becoming sustainable in the foreseeable future. Based on an annualised cost of P 200 for every VIP latrine constructed, the overall cost to government of attaining a 60 percent level of latrine coverage could be as high as P 20 million in 1990 prices every year for the next 20 years.

6.6 There is therefore a strong case on grounds of affordability for the programme strategy to include the development of cheaper sanitation technologies, as envisaged under Strategy Options 2 and 3. This should include an attempt to modify the design of the VIP latrine to significantly reduce costs and enable emptying. To provide an affordable means of addressing the sanitation needs of low-income households, it is also essential that research and development work should include the development of a basic, low-cost toilet facility.

Subsidies

6.7 The existing method of providing subsidies is that government meets the costs of substructure construction and excavation by compressor, as well as the costs of fittings and the budgetary and staffing overheads of operating the programme. These particular tasks were chosen in an effort to ensure that latrines would be built according to the intended standards of sanitation and safety. Subsidies were also a promotional device to attract public interest in the pilot project. No rationale was developed for setting subsidies at any particular level, and indeed the overall level of subsidy was not even known until the Cost Analysis study in 1990.

6.8 The use of subidies has attracted public interest in VIP latrines and enabled more people to be able to afford a VIP latrine at their home. If the main purpose of the NRSP had been to increase the number of VIP latrines constructed, and if high costs were not an issue, the use of subsidies might be considered justified. But the main purpose of the NRSP is to improve public health by adoption of better sanitation and hygiene practices. In addition to their high costs, subsidies have led the population astray by:

- becoming the main selling point and distracting public attention from the fundamental importance of improving knowledge, attitudes and practices;
- reinforcing the myth that household sanitation facilities can and will be provided and maintained by government on an indefinite basis;

- creating an artifically induced demand for VIP latrines which has helped to conceal the fact that they are too expensive.

It is also a known fact that many recipients of the VIP subsidies have been from better-off households with sufficient means to build a latrine without any financial assistance from government.

6.9 Assuming that there will be a shift in emphasis towards more health education and the development of cheaper technologies (Strategy Option 3), we consider that the general use of subsidies should be phased out as quickly as possible and in any case well before the end of NDP7. An expanded health education effort should become the main selling point of the programme, so as to improve hygiene and sanitation practices and stimulate an autonomous popular demand for latrines.

6.10 The process of phasing out of subsidies should be linked to the establishing of expanded and improved capacity for health education and the completion of work to make available a better range of technologies, particularly a low-cost technology. This should be implemented according to a determined timetable as part of the overall plan of action for the rural sanitation strategy. This would need to be carefully planned to minimise potential confusion and loss of public support when subsidies are eventually withdrawn.

6.11 The longer term trends towards greater urbanisation and increased population density can be expected to raise the public appreciation of the need and convenience of on-site sanitation. In the case of new housing in the larger villages subsidies will soon not be a determining factor in inducing people to provide their own latrines. Such villages are quickly being transformed into towns and will soon become subject to physical planning regulations, which make it a requirement that toilet facilities of acceptable standard are provided as part of all new housing construction. In these cases the rationale of using subsidies as an incentive to household participation does not apply.

6.12 In terms of parity with other government subsidy schemes, it might be argued that a general level of subsidy should be retained, but at a reduced level. For this to make sense it needs to be demonstrated that subsidies for VIP latrines are an effective method of realising the overall aims and objectives of the NRSP. The KAP study has shown that the key to improving environmental sanitation is improving the people's overall sanitation and hygiene-related practices through health education; factors such as overall household cleanliness and handwashing after going to the toilet are more important than using a VIP latrine.

Vulnerable Groups

6.13 Even afer lower-cost technologies have been introduced there will be some households which cannot afford to provide their own toilet facilities. In those cases where there are identifiable environmental health risks there is a case for some form of public assistance to be made available. Funds could be provided under social welfare provision to cover the costs of low-cost latrines for vulnerable groups. This support would be administered by council social welfare officers, since they are councils' main expertise for identifying and assisting vulnerable groups.

6.15 We also considered the merits of a sliding-scale of subsidies related to households' ability to pay. On this basis vulnerable groups would be eligible for a high level of subsidy, while higher income groups would not qualify at all. While this kind of means-testing has some theoretical appeal, council social welfare and community development staff have indicated that councils cannot reliably cross-check individuals' declarations about income and wealth[3/]. This possibility has therefore been discarded.

Destitutes

6.16 Some destitutes have been provided with free latrines to be used for demonstration purposes. Councils have used a variety of other funding sources to provide latrines for destitutes. While there is obviously some merit in assisting destitutes in this way, there may be need for a change in approach:

- ***Questionable effectiveness as demonstration latrines:*** the homes of destitutes are not a good location for demonstration latrines. By definition, destitutes are uncared for by their respective communities, and people do not visit them very often. And destitutes will naturally not make much effort to promote the demonstration latrines. If there is a case for demonstration latrines at all, they should be sited at more prominent locations where they will definitely be seen by a large number of people. In any case, provision for destitutes should not be linked with provision of demonstration latrines.

- ***Too many destitutes to provide for:*** in Central district alone there are some 3,000 registered destitutes. To provide all of

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[3/] This problem contributed to the failure of previous attempts to apply a sliding scale to secondary education bursaries.

them with a latrine would absorb a full year of NRSP construction activities at existing rates of implementation, at a cost of about P 5 million. The life expectancy of destitutes may often be quite low so that latrines may become derelict after a fairly short period and substantial new demands are likely to recur every few years. In view of these considerations, the type of provision for destitutes should be confined to a low-cost technology option.

On this basis we recommend that destitutes should be assisted through the measures for vulnerable groups which we have outlined above.

VII OVERALL APPROACH TO LATRINE PROVISION

Existing Delivery Methods

7.1 The programme at present has a marked bias toward a public sector construction programme approach. This entails council intervention in virtually all latrine provision activities and only quite limited inputs from households. As explained in the Cost Analysis, the main tasks are conducted as follows:

- ***Programme Planning.*** Design of programme activities, planning of implementation and negotiation of funding. This is conducted by councils, in consultation with MLGL.

- ***Health Education & Community Mobilisation.*** Workshops, household visits and other education, promotion and dissemination activities to generate awareness and support for improved sanitation through provision of latrines. These are conducted by councils, in consultation with MLGL and MoH, on a very limited scale.

- ***Registration.*** Selection of latrine recipients and payment by recipients of the P 30 registration fee to council. This is administered by councils.

- ***Pit Excavation.*** About half of the pits for existing VIP latrines were excavated manually by households. The other half required excavation by compressor, which has been performed at no charge by councils.

- ***Substructure.*** Below ground construction of waste collection pit, usually with block or brick linings and concrete foundation, and provision of removable slab of reinforced concrete at surface level. This work is performed by councils or contractors hired by councils.

- ***Superstructure.*** Above-ground construction of exterior walls, roofing and door. This is the responsibility of households.

- ***Fittings.*** Attachment of toilet seat, vent pipe and flyscreen to completed latrine superstructure. This is generally done by councils, although households are now required to attach their own fittings under the KFW-funded activities in Central district.

7.2 The difference between the council and contractor delivery mechanisms

is limited to whether the substructure is build by council direct labour or by contractors. Contractors are usually more cost-effective for larger and less remote villages, and should be considered as the main delivery mechanism in such cases. Council delivery is currently needed where few contractors are available or tender prices are excessive, particularly in more remote locations. The Cost Analysis study indicated that implementation rates could be increased and unit costs of provision could be reduced if adequate manpower were provided for supervision, planning and programme management.

7.3 As we have seen councils take charge of almost all programme activities. The present delivery mechanisms therefore suffer from the serious disadvantage that they tend to perpetuate dependency on government for latrine provision; they do nothing to promote more sustainable approaches which emphasise health education and the responsibilities of householders themselves.

7.4 There is some limited scope for improving the efficiency of the existing delivery mechanisms, for example through encouraging the use of labour-only contractors or by better planning of the timing of pit excavation activities in relation to substructure construction. However, a radical change in the approach to provision is needed if costs are to be reduced to an acceptable level and the programme is to become sustainable in financial terms. Only Strategy Option 3 envisages such a change of approach.

Alternative Delivery Options

7.5 Under Strategy Option 3 the expanded health education can be expected, in combination with more effective cost-recovery initiatives, eventually to lead to households willing to accept responsibility for latrine construction; councils' leading role in construction and maintenance of latrines will then fall away.

7.6 We have identified a possible self-help 'package' which could in the short term be introduced alongside the existing delivery mechanisms. This would compete with existing delivery mechanisms and even replace them if the new package proves popular. In the long term, the aims of health education and social mobilisation have to be to make it possible to transfer all implementation responsibilities to households. The main features of the two new delivery options are:

- ***Self-help 'package'***. At the time of registration households opt to obtain a kit including specialised substructure materials (inclusion of superstructure materials as a complete 'kit' might also be considered) and fittings. They also get a booklet explaining how to go about construction and installation. The

kit is supplied by approved private builders merchants[1/], at a price geared to the present level of government subsidy. The council issues vouchers to householders who hand them to the 'kit' suppliers. Householders can then proceed with construction without the delays associated with the existing forms of delivery. They will often be able to negotiate competitive construction prices with their local builders or, in cases of low income households, can opt to carry out construction themselves. There would be provision for inspection of the completed latrine by council staff. Households would get their latrines faster and more cheaply, and government would save on recurrent costs and a reduction in its construction workload. If the 'package' idea proved unsuccessful, the existing delivery methods would simply remain in place.

- ***Complete self-help approach.*** One of the long term aims of placing greater emphasis on health education and community mobilisation (as under Strategy Option 3) would be to transfer all construction responsibilities to households and all materials and equipment supply to the private sector. This would eliminate the need for government latrine construction activities (with possible minor exceptions, such as provision of demonstration units), and would achieve major reductions in the costs to government.

7.7 Since the total demand for latrines would be closely related to the success of health education efforts, there would be an incentive for private firms to play a supporting role in health education. There would even be scope for health education efforts to make use of the marketing and advertising skills of the private sector and to take part in jointly-financed 'promotions'. This would need to handled with care to ensure that private sector marketing of latrines did not outstrip health education efforts, since this would once again turn the programme into a construction programme.

7.8 A self-help 'kit' approach has been introduced in Lesotho. It appears to have been successful in establishing both the necessary private sector capacity and the adherence to approved standards. A key feature of this approach is that the Government of Lesotho provides training for small builders, the rationale being that once the builders have been trained to the required standard of latrine construction they will be designated as officially-approved installers of the latrine kits.

[1/] If there were problems regarding the availability and competitiveness of private 'kit' suppliers, this role would have to be retained by councils.

7.9 It is essential that pit excavation by compressor should be transferred to the private sector, particularly in view of the poor performance and high cost of council compressor teams (identified by the Cost Analysis). But there are some uncertainties about private sector capacity and costs. Within the vicinity of towns and larger villages we expect that existing plant hire firms could provide a compressor hire service. With sufficient effective demand and a parallel provision for training there could be an adequate supply of compressor operators within a fairly short period.

7.10 For smaller and more remote settlements we are less confident that satisfactory pit excavation services could be arranged privately. Compressor hire companies would not locate in these areas, and it would be difficult and costly for individual householders to arrange to hire compressors from major centres which are far away. There might also be greater problems in identifying trained operators. The problems could eventually be overcome by encouraging groups of households to jointly hire a compressor and a trained operator, but in the immediate future there may be pressure to retain a limited council compressor service which would be mainly restricted to assisting more remote settlements. Any such service would have to aim from the start for a high degree of cost-recovery, since the greater the element of subsidy the less likely it is that people will ever voluntarily dispense with the service in order to look after their own needs. In this regard, a rule-of-thumb could be that no-one in a remote village should pay less to hve a pit excavated by the council than the fee charged by private firms in the other villages for the same service.

7.11 The problem of attracting reliable private sector contractors may be greater in the more remote areas, notably Ghanzi, Kgalagadi, North West districts, and also in parts of Central district. Such operators are also eligible for FAP grants which are greater in remoter areas. The building of a latrine is a relatively unsophisticated and easy construction task. Gaps in supply can within a reasonable time period be overcome by establishing a popular demand for toilets through health education, and through training small builders and pit excavators to take up the supply opportunities. If further investigations were to confirm the indications we have received to the effect that health risks from lack of latrines are not significant in more remote areas, such areas should be accorded low priority in council workplans.

7.12 The existing scale of activities of the NRSP understate the potential size of the market for rural latrines. As an illustration, if the proportion of 14 percent VIP and 86 percent non-VIP can be used as a proxy for the relative numbers of VIP and non-VIP latrines currently being build, then the national market is more than 20,000 latrines a year, not the 3,000 VIP latrines being built under governmental auspices. Even if under Strategy Options 2 and 3 the average cost of provision were reduced to P 800, an

annual market this size is worth P 17 million - more than enough to attract competent and well financed private sector providers and suppliers.

7.13 Both our alternative delivery options would entail a reduction in government's responsibilities for latrine construction. Government roles would remain in programme planning, improvement and expansion of health education and providing guidelines and standards for latrine building[2/]. Householders would take over responsibility for latrine construction.

Exhibit 4A: Changing Roles in Latrine Provision

PROGRAMME ACTIVITY	STRATEGY OPTIONS 1+2	STRATEGY OPTION 3	
		Latrine Kit'	Long Term
Programme Planning	Council	Council	Council
Health Education & Social Mobilisation	Council	Council /Community	Council /Community
Registration	Council	Council	None
Pit Excavation	Household /Council	Household	Household
Substructure	Council /Contractor	Household	Household
Superstructure	Household	Household	Household
Fittings	Council	Household	Household

7.14 To implement the strategy it is desirable to involve the private sector from the start and draw on private sector knowledge and advice. Given the commercial opportunities outlined above, some form of Private Sector Sanitation Group (PSSG), might be established under MCI or BOCCIM auspices, comprising representatives from local manufacturers, builders merchants, construction firms and the Botswana Confederation of Commerce, Industry and Manpower (BOCCIM). Government participation would include the technical unit in MLGL, MLGL's buildings and procurement adviser and representation from MoH and possibly occasional participation from DTRP and DWA. Such a group could make important contributions towards research and development into latrine technologies, help to ensure that these could be locally produced and work

[2/] This is quite similar to the 'organisational and facilitative' role which the Government of Lesotho has adopted for its national rural sanitation programme.

towards the establishing of government-approved or voluntary technical standards[3/].

7.15 A first step towards harnessing the private sector might be to stage a seminar where government and private sector representatives would discuss opportunities for private enterprise within the rural sanitation strategy.

7.16 The proposed alternative delivery mechanisms outlined above would offer economic and political advantages by supporting private enterprise development and employment creation. Private sector providers and suppliers would be able to draw on existing forms of government support such as FAP and training schemes for small builders. The possible enterprise opportunities might include:

- latrine building;
- pit excavation services;
- manufacturing of ventpipes, flyscreens, coverslabs, superstructures and other latrine components;
- supply of building materials, kits and components;
- periodic latrine maintenance and servicing.

We are aware that many of these activites are already being conducted to some extent by the private sector.

Upgrading Non-Programme Latrines

7.17 Most on-site sanitation in areas covered by the NRSP is in the form of non-NRSP latrines. While structural defects cannot be cheaply or easily upgraded, the health impact of many such latrines can be improved through minor modifications, particularly attaching a ventpipe and fly screen. This is sufficient reason for instituting a low-cost upgrading programme for existing latrines. This programme, directed at people who have already paid the full cost of their own latrines, will have not trouble in maximising self-help and private sector inputs. The approach could be like that used by the SHHA technical division, which has assisted house upgrading programmes by providing technical advice and loans.

3/ It is worth noting that in broadly similar circumstances a voluntary code of practice may soon be introduced for the supply and installation of solar water heaters. This follows joint efforts by private firms and government to address the problem of unreliable quality standards.

Timeframe

7.18 Under Strategy Option 3 it would be advisable to retain the existing methods of delivery until expanded health education and social mobilisation are in place and an improved range of technologies has been developed. The 'kit' option could be introduced quite quickly to operate in competition with the existing delivery methods. The pace of development thereafter could depend mainly on the rate of adoption of the kit alternative. It is reasonable to suppose that the transition to a complete self-help approach could be completed by the end of NDP7 - the timetable for achieving this objective would allow for promotion of the new approach to households and the private sector; the training of builders; and the changes of approach and technology which would initially place additional demands on councils.

VIII HEALTH EDUCATION AND SOCIAL MOBILISATION

Importance of Health Education

8.1 The KAP study has shown that provision of a pit latrine does not have a direct impact on diarrhoeal incidence. Only when a pit latrine is accompanied by improved usage practices and better overall household hygiene does it make a difference (KAP Study, p142). However, until now the NRSP has concentrated on promoting the construction of latrines, using subsidies as a major selling point. Although health education is the main way to help people to adopt improved practices, the health education component of the NRSP has largely been limited to talks at the kgotla.

8.2 The adoption of better sanitation and hygiene practices is largely dependent on health education. Although some councils have been successful at encouraging people to build latrines, this in itself will not improve overall health standards or have reduce the incidence of diarrhoea. The KAP study shows that even in households with latrines some family members do not use them. (ibid, p 111). Males often do not use latrines to urinate and most under-fives do not use latrines at all (ibid, p 143). The washing of hands after using the toilet was identified as another problem area. People are not doing it, although research elsewhere does show that washing hands with soap after going to the toilet does break the oral-faecal transmission cycle and can have an impact on the incidence of diarrhoea.

8.3 A large majority of households feel that the ownership of a latrine has considerable convenience value and improves the quality of life. On the other hand the presence of a latrine does not automatically mean that the oral faecal transmission cycle of diarrhoea is broken, particularly with infant members of the household who are most at risk. Therefore unless the personal hygiene habits of all members of the household are changed the incidence of diarrhoea will continue to be a problem.

8.4 In 1991/92 only about eight percent of the NRSP budget is allocated to health education. Council health department staff seem to attach low priority to the health education aspects of the project in terms of allocation of their time.

The Existing Situation

8.5 There are currently three main government programmes dealing with different aspects of sanitation. These are the Water Hygiene Education Programme (WHEP), the Control of Diarrhoeal Diseases Programme (CDD), and the National Rural Sanitation Programme (NRSP). The focus of each of these

programmes is as follows:

- ***The Water Hygiene Education Programme*** focuses on showing people how to store and use standpipe water in a clean way, and promotes hand-washing. Much of the education activity is carried out at schools, through the school health clubs. The programme is implemented by the district health teams, with the DHENO generally having a key role.

- ***The Control of Diarrhoeal Disease Programme*** concentrates on training health personnel in how to prevent and treat dehydration following diarrhoea. Programme activities include demonstrations to parents on how to care for children who have diarrhoea at home by giving them extra fluids to drink in order to prevent dehydration. With the assistance of UNICEF a programme for training of trainers is being organised to improve the dissemination of information and skills on diarrhoeal disease control to health personnel.

- ***The National Rural Sanitation Programme*** is concerned with the promotion of VIP latrines in rural households. Council health departments are responsible for implementation at the district level.

8.6 Each of these programmes has its own distinct set of messages and its own target group. This is summarized below.

Exhibit 8A: Existing Governments Sanitation Programmes

Programme	Audience	Message
WHEP	School Children	Personal Hygiene
CDD	Mothers	Use of ORT
NRSP	Households	Build Latrines

8.7 The technical and advisory units of the WHEP and CDD programmes are based in MoH. Both programmes are managed by the Family Health Division, although responsibility for policy formulation, monitoring, and message prioritization is shared with the Environmental Health Unit in the Community Health Services Division. The technical unit for the NRSP is based in the MLGL. Implementation responsibility for all three programmes rests with the district councils.

8.8 Under the NRSP the current approach to health education and social mobilisation is characterised by:

- talks at the kgotla when the programme is being launched within a community, with the emphasis on construction subsidies in order to gain acceptance of the programme;
- occasional follow-up talks at the kgotla, and occasional home visits by FWEs and talks at the clinics;
- talks at the demonstration latrine site, with the emphasis on the technical details of how to construct a latrine.

The district sanitation coordinator is responsible for organising educational events at the kgotla and demonstration sites. Educational inputs by other extension workers are dependent on the goodwill and self-motivation of these individuals and their immediate supervisors.

8.9 Each programme relies on the MoH's Health Education Unit for the production of educational materials. All three programmes have to compete with each other, and other MoH programmes, for the services of the Health Education Unit. Since the unit is under staffed, WHEP, and to some extent NRSP, have acquired additional personnel to meet their requirements in this area. Examples of materials that have been prepared for the NRSP are shown below:

Exhibit 8C: Examples of Materials Produced for SHESP

Type	Target Audience	Description
Posters	Villagers	Publicity on latrine construction
	Villagers	How to prevent bilharzia
	Villagers	Posters on environmental health, including hand washing, cleaning standpipes and using a latrine
Booklets	Villagers	Operation and maintenance manual for VIP latrines
	Extension workers	Information manual on VIP latrines
	Villagers	Environmental hygiene
T-Shirts	Villagers and extension workers	Promotional/publicity
Flipcharts (KFW project)	Villagers	Environmental hygiene

Other materials prepared for the WHEP and CDD activities are also available but again the range and variety of materials is limited. An effort is now being made to develop materials that will serve all three programmes.

Operational Principles

8.10 The main operational principles that should guide the design and implementation of the health education strategy for the NRSP are:

- ***A problem-based approach*** where the programme evolves out of analysing and solving the problems identified by the target audience, trainers and specialists. The strategy should build on the findings of the KAP study and earlier evaluation reports.

- ***Limiting and focusing the educational content*** on priority messages that are within the reach of the target audience. Again the KAP study provides a framework for selecting priority messages. The main emphasis should be on:

  (a) what is achievable in respect of the target audience, taking into consideration the possible effects of phasing out of subsidies;

  (b) what is achievable for the implementing agencies in relation to the resources available to them;

  (c) what is likely to have the greatest impact on health standards.

- ***Initially seeking to achieve satisfactory quality standards*** before attempting to achieve widespread coverage. A re-focused NRSP with a greater emphasis on health education (and lesser emphasis on subsidies) means a substantial shift from the present strategy. This will require district health teams and field officers to adopt new ways of mobilising the communities. These should be tested out in each district before attempting to launch a district-wide sanitation programme.

- ***Phasing of implementation in accordance with available resources:*** implementation plans need to be based on a realistic assessment of resources, particularly manpower. Various studies, including earlier evaluation reports of the sanitation programme, have noted that an important limiting factor is the staffing and morale within the extension services. Whilst family welfare educators, for example, are regarded as having a key role in

community education, in practice they spend a large proportion of their time at the clinics or health posts and do not allocate much time to educational activities. Implementation plans should be based on what people actually do rather than what they ought to do.

- ***Facilitating the health education process by recruiting and training community facilitators:*** government extension workers represent one source of manpower, but there are other potential health educators in the community. Since the health education messages are relatively clear and simple, a person does not need in-depth medical knowledge to educate others about the correct treatment for diarrhoea. The challenge is to persuade people, particularly mothers in this instance, to change their behaviour. Well-informed peers can often be successful at this. The health education strategy needs to consider what additional resources are available in the community to complement the efforts of the government extension workers.

- ***Developing learning materials which are simple, manageable, focused and 'teacher-proof':*** where the aim is mass coverage, good teaching aids are those that can be effectively utilized by the average extension worker or volunteer, and where the content is sufficiently self-explanatory for the users not to need lots of additional knowledge to effectively convey the message.

- ***Making use of a multi-media approach:*** the basic technique in community education should be face-to-face contact between the community animators and the villagers, utilizing appropriate visual aids and motivational media. This approach can be complemented and reinforced by using mass media to maintain interest and bring the key messages regularly to the attention of the public.

Educational Objectives

8.11 The overall purpose of the environmental health and sanitation strategy is to *increase the peoples' understanding of the need for improved personal and domestic hygiene* and, based on this, to motivate individuals and households to take appropriate action that will improve their standards of personal and domestic hygiene.

8.12 A major indicator of this improved standard of health-related behaviour will be *a reduction in the incidence of diarrhoea & diarrhoea-related deaths amongst infants.*

8.13 To improve peoples'understanding of the links between domestic and personal hygiene standards and health, the specific knowledge-based objectives are to educate families about:

- the need to give correct and timely treatment to infants who have diarrhoea;
- the link between contaminated water and diarrhoea; and
- the link between personal hygiene and household sanitation habits and diarrhoea.

8.14 On the basis of this improved understanding, the specific behavioural objectives of the environmental sanitation strategy are:

- to encourage the proper treatment of diarrhoea through the use of ORS packets and increasing the intake of fluids
- to encourage the washing of hands after going to the toilet, and before preparing food
- to encourage the proper storage of drinking water
- to improve household hygiene standards through the use of appropriate toilet and waste disposal facilities

Target Group

8.15 To achieve the aim of improving the standard of domestic and personal hygiene in rural households the health education programme will have to reach two broad sections of the rural communities:

- members of rural households
- extension workers and community facilitators

Each of these is discussed in more detail below.

8.16 The primary focus should be on the members of the rural household. While the education programme should seek to reach all members in terms of influencing behaviour, some members are likely to be more receptive than others. Those who will be more receptive are:

Mothers who:

- control the day-to-day domestic activities in the household, including cooking, and storing of food and water;
- care for infants and are involved in the weaning process;
- clean the dwelling-place, deal with rubbish disposal and clean the latrine.

Older children who:

- help with domestic chores;
- take care of younger children, including cleaning after defecation.

Mothers and elder children have a key role in controlling the hygiene and general health habits of the household, particularly those of the young children who are most likely to get diarrhoea. In this respect mothers and elder children are a priority target group for the mobilization and education programme, as are young school-age children. Establishing good hygiene habits among this agegroup will have long term benefits. School children are the main focus of teh WHEP activities.

8.17 A secondary target group are the extension workers (health inspectors, community health nurses, family welfare educators) and community facilitators (volunteers from community groups such as the Red Cross and BCW) who will be involved in informing and educating households about the priority messages. They will need to be briefed about the strategy and provided with training on the content and methods of delivery.

Priority Messages

8.18 The NRSP does not need to convince people of the benefits of having a latrine - the KAP study found that only 10% of those who are using the bush for defecation claimed to be satisfied with that method. What the NRSP needs is to convince people that they should construct latrines that are of an acceptable standard, at the same time as they improve other hygiene and sanitation related behaviour. Thus, as mentioned above, the educational component of the NRSP needs to be related to broader issues of environmental sanitation and personal hygiene.

8.19 A comprehensive sanitation programme will have to decide which particular messages have priority. Given that the overall goal is to improve household hygiene standards and more specifically reduce the incidence of diarrhoea deaths, then the immediate priority should be:

- ***Encouraging prompt treatment of diarrhoea:*** the KAP study reports that mothers usually wait at least two days before taking a child with diarrhoea for treatment at a health facility, and one in four wait at least four days (p139).

- ***Encouraging the proper treatment of diarrhoea:*** the KAP study shows that over 50% of mothers do not increase the fluid intake of children suffering from diarrhoea (p140).

- ***Improving weaning practices:*** the KAP study shows that the incidence of diarrhoea is highest for children between the ages of 7-12 months (p139).

- ***Encouraging parents to let their children use pit latrines:*** the KAP study shows that 64.5% of households with a pit latrine dop not permit under-fives to use the toilet, for fear that they might fall in (p120). Where toilets do not exist then the objective should be to teach mothers to correctly dispose of faeces from their infants.

- ***Encouraging the washing of hands after going to the toilet:*** the KAP study shows that hardly any households with latrines have hand washing facilities at the latrine (p114).

- ***Encouraging proper maintenance of latrines:*** the KAP study shows that a substantial percentage of latrines, both VIP and non-VIP, are not properly maintained (pp112-114).

- ***Encouraging households which have non-VIP latrines:*** of the 41.4% of households with a pit latrine only 13.6% have VIP latrines (p107).

- ***Improving household hygiene:*** the KAP study lists a wide range of issues where improved household hygiene practices would help to reduce the incidence of diarrhoea (pp 128-129).

8.20 With this set of priorities the construction of latrines would become only one of several medium-term goals, which would be the 'end product' of a focused educational campaign. In terms of latrine construction there are

two broad objectives:

- where households already have a non-VIP latrine, to persuade them where necessary to upgrade the quality of their latrine.
- where new latrines are being built, to assist households or contractors with the technical advice that will enable them to build a latrine that meets satisfactory health standards

These objectives are based on a strategy of raising awareness and should be linked to the broader health education issues outlined above.

Methods and Materials

8.21 Evaluations of both the ESPP and SHESP identified health education as the weak component. Poorly motivated extension personnel and inadequate guidelines, training and support for health education programmes were identified as the main contributing factors. This situation has not changed.

8.22 Although a variety of educational materials are available for use by NRSP, WHEP, and CDD, they were prepared in the absence of a cohesive delivery system. Health education largely consists of talks at the kgotla or clinic and home visits by FWEs. The educational input of other sections of the health service is dependent on their goodwill and takes place on an ad hoc basis. The gap between knowledge and practice on many of the sanitation issues suggests that new educational approaches are required to induce effective change.

8.23 As the main implementing bodies, the councils need more guidance on how to organise the educational component. They do not have the necessary resources to become involved in the detailed tasks of material development. There is a clear role for the technical units, based in the ministries, to give comprehensive support and advice to the implementing agencies.

8.24 A health education 'package' should be developed for use by the councils. The package would provide materials and guidance on the minimal education input that the districts should aim for in a sanitation campaign. The package should provide details on:

- aims and objectives of the education component;
- training of extension personnel and community facilitators (including training materials);

- methods and materials to be used (including educational materials);
- timing and phasing;
- evaluation, data collection and analysis.

The 'package' should also outline the minimum resource requirements that are needed to implement this programme.

8.25 The aim would be to develop an integrated, sanitation-related health education programme that is:

- based on a comprehensive package of technical and health information geared to the needs of the target group;
- delivered in a planned manner based on a campaign approach;
- adapted to a multi-media approach.

8.26 A campaign approach would enable a council to concentrate its resources on a particular geographical area for a specific period of time. Over a period of 6 to 12 months a series of planned educational interventions would be made in the targeted communities. During the campaign period messages would be introduced in a phased manner.

Exhibit 8C: Example of a Phased Campaign

Phase 1: Prompt & proper treatment of diarrhoea
Phase 2: Improving weaning practices
Phase 3: Washing hands
Phase 4: Latrine construction & adaptation
Phase 5: Management and use of latrines

Where appropriate this phasing should be adjusted to take account of seasonal factors.

8.27 A preliminary step in each target community would be to undertake a 'community sanitation survey'. The purpose of the survey would be to collect baseline data on sanitation standards and facilities in the community. For example:

- number of latrines
- number of VIP latrines
- number of households with rubbish pits
- condition of standpipes
- condition of school latrines.

The survey would be organised by the village health workers or the whole village extension team. By involving members of the community, the survey would provide an opportunity to build up community participation and develop a more sustainable education programme. The survey would help to:

- establish basic monitoring and evaluation data
- give a local emphasis to priority messages
- identify potential organisations and individuals that could assist with the education campaign

8.28 Subsequent health education interventions should be aimed at providing information and raising awareness around the priority messages. The primary focus should be on methods that emphasise face-to-face teaching, peer group contact and community participation. Appropriate methods will have to be used to stimulate interest at each phase. An example of use of different methods at different stages is provided below:

Exhibit 3C: Examples of Health Education Methods

Task	Health Education Methods
Start-up (to stimulate interest)	Popular theatre focused on the specific message or set of messages for that phase. Depending on the size of the community this might take at a central venue (the kgotla) or a series of venues.
Information	Teaching people what to do through talks and demonstrations - for example how to prepare ORS. This type of intervention might include a flip chart story and songs to motivate people, and a practical demonstration - to show people how to mix ORS, store water, make an incinerator, construct a latrine, etc
Reinforcement	Through the mass media, school competitions, literacy groups etc

Community participation should be encouraged through community planning workshops around key events, such as community sanitation surveys, selection and training of local volunteers, choice of latrines and siting and building demonstration latrines. Extension workers will have to be trained to run workshops in a participatory manner.

8.29 This basic community approach could be complemented by school

competitions within the target areas. School competitions might take the form of the 'best poster, song or story' or the 'best sanitation activity'. Slides and films can be used at special events, provided that they are presented in an appropriate manner.

A Community Team Approach

8.30 Extension services in Botswana are sectoralized and unless an issue is given national priority the different sectors focus on their own programmes. Implementation of a sanitation programme that emphasizes the health aspects (as opposed to the technical) should be primarily the responsibility of the councils' community health workers. Depending on the size of the community these health workers include:

- Family Welfare Educators
- Enrolled Nurses
- Health Assistants
- Health Inspectors

8.31 Whilst the FWEs and Enrolled Nurses are attached to clinics and health posts, the clinic sessions are often completed by lunchtime and there is therefore time available for community education activities. This is particularly the case in smaller communities. On the other hand, FWEs do have many demands made of them, ranging from participating in immunization campaigns to acting as translators for doctors. A realistic appraisal will have to be made of what input can reasonably be expected of them.

8.32 To achieve effective coverage the community health workers will need support. There are number of options:

- ***The village extension team.*** These teams have the potential for being the core implementing body. According to Part H of the District Planning Handbook the membership of these teams embodies a broad range of extension services and if all were committed would offer an effective coverage within a community. However many of the village extension teams are inoperative and many individual extension workers have no commitment beyond their own immediate programmes. Unless a **real commitment** can be obtained from other council and central government extension departments, then building an implementation strategy around the village extension teams will not be effective.

- ***The Village Health Committee.*** Village health committees tend to be made up of the more elite members of the community, and often

the members are also members of other community organisations such as the VDC, Red Cross, BCW, etc. Many VHCs are not functioning, in part because of the lack of any real purpose. Involvement in a sanitation programme, where they have a very clearly defined set of tasks, may help to revive these committees and obtain a level of community involvement that is vital to the effective implementation of primary health care programmes.

- ***Other community resources.*** A variety of other manpower resources exist in the communities, ranging from local voluntary groups, primary school teachers, Tirelo Setchaba participants, the village pumper, literacy assistants and group leaders, and so on. If asked to work with the parts of the community that they normally deal with, the involvement of these groups or individuals could help to strengthen and complement the efforts of the community health workers. Given the campaign approach that has been outlined above, TS participants might also be recruited to work on particular campaigns within districts.

8.33 A community team approach will be a key component of this strategy. A team of four or five can achieve a substantial improvement in health education. The team members would be drawn from government extension services, schools and local voluntary groups, and would have to be trained on how to use the educational materials and on the details of the messages. In some cases they could work together as a team - such as organizing the popular theatre - and in other cases they would operate as individuals giving talks to and assisting individuals and groups in various parts of the community. It is essential that the team should be given a limited and manageable set of tasks that can be completed within in a reasonable time period.

8.34 Extension workers and volunteers - recruited from the VHC, local voluntary groups, and at the community planning workshops - should be <u>models</u> for the type of behaviour targeted for the rest of the community. Changing their own attitudes and practices in relation to hygiene and sanitation is an important first step in influencing the rest of the community.

8.35 It is unreasonable to expect individuals to volunteer for long or unlimited periods of time, or to expect one person to be able to sustain the interest of the community for long periods. The aim should be to have a series of brief interventions based on well-defined messages and well-tested educational materials.

8.36 Construction of demonstration pit latrines should be one part of the education strategy. It should be linked to the appropriate phase of the campaign.

8.37 These aspects of the strategy should be augmented by the use of the mass media. Although not tied to any one campaign period, the radio could help to reinforce learning through the development of soap operas, jingles, 'spots', and songs. To capture attention the jingles, 'spots' and songs would have to be varied and broadcast periodically.

8.38 Over the past decade or so, a broad range of experience has been built up in many different countries on community education strategies in the water and sanitation sector. Materials and motivational techniques have been developed that can serve as a model and be adapted to the needs of a particular situation. The NRSP has endeavoured to draw on experience from elsewhere and should continue to do so, and at the same time build up a resource centre of relevant materials and documents.

Scale of Operations

8.39 Implementation of the strategy will be the responsibility of councils. Each council should be allowed to decide <u>when</u> and <u>where</u> it will implement the programme. After the councils have been introduced to the sanitation 'package' they should be encouraged to formulate an implementation plan that will take into account:

- the availability of resources (manpower, transport, etc);
- the other commitments of the council, particularly with regard to health and community education;
- prioritising of communities in respect of sanitation.

8.40 The aim should be to have a scale of programming that is manageable in terms of the resources available. It is anticipated that few districts will have the resources to take on a district wide campaign, but this is not necessarily an obstacle to effective programme implementation in view of the likely difficulties with management and ensuring an effective campaign.

8.41 The plan should be to cover the district on an area-by-area basis. The number and size of the areas will vary from district to district. Each council will also determine whether or not the implementation campaign in one area will overlap with the campaign in another.

Coordination of Health Education Programmes

8.42 Better coordination of the three existing health education programmes is needed in order to increase their impact on the health standards of the villagers. There are a variety of ways in which this might be achieved.

8.43 The Primary Health Care Coordinating Committee is formally responsible for coordination, and its membership is drawn from MoH and MLGL. This meets only occasionally and is concerned with policy rather than programme issues. There is also informal liaison between the programmes, at both ministry and district levels. Officers in the technical units in the two ministries do meet and exchange ideas and information, as do staff working at district and village levels. The three programmes, for example, cooperated on the KAP survey.

8.44 In order to maximize health impact there is a need for closer cooperation between programmes. As already noted, the NRSP will have a very limited impact on improving health standards unless a much greater emphasis is given to educating people about environmental health and sanitation practices. It is equally apparent that people see a benefit in having a household latrine and it is important that latrines that are constructed in the future are of an acceptable health standard.

8.45 At present each of the existing health education programmes is planned and operated independently of the others. Each tends to focus exclusively on its own set of messages, utilizing a specific category of health personnel. There is scope for cooperation between programmes, say for example, on the simultaneous promotion in the same villages of improve personal hygiene (in the schools) and the construction and improved management of household latrines. However, the WHEP and NRSP operate in isolation from each other at present. Joint efforts in the same villages would not demand any major readjustment to programme management and control.

8.46 The efforts of the three programmes need to be much more closely integrated. There is a need to achieve a more focused and integrated set of messages, and to more effectively utilize available resources. The steps that can be taken to achieve this range from a joint programming approach to an actual institutional merging of the technical units at the ministry level and of responsibility for implementation at the district level.

8.47 In the short term there are three immediate and practical measures that can be taken to achieve a sanitation strategy that will have a greater impact:

(a) ***The NRSP should give greater recognition to the need for health education.*** This should involve:

- allocating more resources to this component of the programme;
- re-training the NRSP field staff in health education skills as well as the technical skills related to latrine construction;
- utilizing and augmenting the educational materials being developed for WHEP and CDD programmes.

(b) ***Each council should develop an overall district sanitation plan.*** This should:

- encompass all three programmes;
- take account of the manpower needs of each programme and the manpower resources that actually exist;
- give consideration to the scale of operation in relation to the available resources;
- above all, focus the activities of the three programmes on the same geographic area at the same time, so as to enable much closer cooperation between the different programmes.

(c) ***Appoint an overall district sanitation coordinator.*** A greater degree of cooperation will be achieved if overall implementation responsibility at the district level rests with one officer. At the moment implementation responsibility for each programme rests either with a different council department or different sections within the district health team. There is no single officer in charge.

8.48 At the national level the day-to-day informal contact between programme officers should be encouraged. Decisions about overall policy and strategy could be formalised through the creation of a sanitation sub-committee of the PHC Coordinating Committee. If comprised of senior programme officers and co-opted specialists, but kept to a manageable size) this sub-committee could serve as an advisory body.

IX IMPLEMENTATION CAPACITY

Latrine Provision Capacity

9.1 Most council latrine construction programmes are short of qualified manpower. They rarely have enough staff for supervision, including health assistants, village sanitation coordinators and works department staff such as building inspectors. This limits the scale of activities and contributes to low labour productivity and high costs of provision. Under the contractor delivery method there are also too few sufficiently trained contractors. Until now there has been little effort to train householders in building techniques.

Options for Strengthening Latrine Provision Capacity

9.2 Since the NRSP must ultimately compete with other government activities for scarce manpower, it is likely that staff shortages will continue for some years to come. Where latrine provision is dependent on council provision (Strategy Options 1 and 2), this implies that over the short and medium term the annual provision capacity will be limited. The Cost Analysis identified management and supervision as the key constraints and recommended that all councils should have at least one district sanitation coordinator to manage the programme and village sanitation coordinators to provide full-time supervision of all labour teams and contractors. Even on this basis it was necessary to assume that annual provision capacity would be limited to about 3,000 latrines per annum until the mid-point of NDP7, after which it would increase to about 4,000 latrines per annum. This implied that a target level of coverage of 60 percent would be achieved in 2010, and that annual provision could be reduced to around 2,500 thereafter.

9.3 To achieve such targets the existing gaps in NRSP management and supervision capacity within councils would need to be filled. This would partly depend on the priority attached to rural sanitation by each council. It would also require that ULGS should become more responsive to the manpower needs of the NRSP.

9.4 Assuming that adequate management and supervision capacity is put in place, council building supervisors are well aware that all strategy options and all council construction activities, not only sanitation, would benefit from increased training of small rural contractors. Various institutions, offer relevant training courses (especially those concerning business administration and management) and councils need to ensure that these are taken up. Councils should continue their efforts to simplify tender procedures, develop options such as labour-only contracts, improve briefing

of contractors and ensure that construction of demonstration latrines is given a prominent place in the training of contractors.

9.5 Since Strategy Option 3 envisages a shift in emphasis away from government construction and towards health education and social mobilisation, an important feature will become teaching the communities how to construct their own latrines; this approach is in use in Zimbabwe, where more than 100,000 VIP latrines have been built since 1980. If a self-help implementation capacity can be developed within the community along with improved awareness about environmental health, the constraints on provision capacity can be overcome and the costs of the NRSP can be reduced.

9.6 Under Strategy Option 3 the development of private sector supply and distribution would be a further important means of strengthening capacity. MLGL should encourage local manufacturers and builders suppliers to make and stock latrine materials and fittings. This might eventually lead to the development of a series of approved standards which could be supplied by the private sector with government endorsement.

Technological Research and Development

9.7 One of the main explanations for observed weaknesses in the latrine technology is that government lacks institutional capacity for technological research and development. Such capacity will need to be established under Strategy Options 2 and 3, notably for the development of a range of better technologies, to test these out on a pilot basis, and to liaise with potential manufacturers of the main components.

9.8 There are many possible approaches to securing technological expertise. We consider that where possible the approach should involve establishing of permanent local capability, and that technical assistance personnel and short-term advisors should be used only sparingly. Ways of achieving this might include:

- ***Increasing technological expertise in MLGL.*** However, MLGL is mainly concerned with administrative rather than technological duties, lacks research facilities and probably could not offer a wide enough base of technical expertise.

- ***Attaching technological expertise to another institution.*** The Botswana Technology Centre and Rural Industries Innovation Centre are currently being developed as the country's main centres for technology development. Such institutions could provide a supportive environment for sanitation research and development. Work might be arranged on a goal-oriented, contract basis. There

could also be scope for contracting-out some research tasks to private firms, or possibly to the University of Botswana. MLGL should initiate discussions with such institutions to establish a basis for their future involvement in research and development activities.

- ***Collaborating with other countries facing similar problems.*** All of the other SADCC countries and South Africa are facing major challenges in rural sanitation. There is within the region a useful stock of experience and expertise in different sanitation technologies. The Blair Research Laboratory (BRL) of the Ministry of Health in Zimbabwe deserves special mention, since it is the region's leading centre for research into sanitation technologies. BRL was the originator of the VIP latrine in the mid-1970s and, in south-western Zimbabwe, has tackled geographical conditions which are similar to parts of Botswana. Cooperation with BRL should be initiated as soon as possible.

9.9 MLGL does have access to sociologists (through its Applied Research Unit) and economists (through the Planning Unit), and their inputs will also be needed as part of a multi-disciplinary effort to improve the latrine technology.

Adequacy of Resources for Health Education

9.10 The current capacity of the district councils to implement a comprehensive health education programme (as envisaged under Strategy Option 3) is limited:

- the role of sanitation coordinator has been delegated to health assistants, a relatively junior cadre with no weight in terms of getting priority for the NRSP.

- village sanitation assistants have been selected on the basis of their ability to provide technical advice and support on latrine construction; they are not community educators. Not all districts have recruited village sanitation assistants.

- in approximately half of the councils the post of district health education & nutrition officer (DHENO) is vacant. In the districts where DHENOs are in post their efforts are largely concentrated on activities related to WHEP.

- the family welfare educator (FWE) cadre has to a large extent taken on a nursing auxiliary role and some of its members are apparently no longer motivated to undertake extensive community education activities. In many instances FWEs do provide the necessary manpower at clinics where there are shortages of nursing staff.

9.11 Several of these cadres have been depleted through attrition and non-replacement. The training of family welfare educators was suspended in 1988 and the training of DHENOs and health assistants has also stopped. MoH is considering launching a new course to train health educators but as yet there are no definite plans. The health assistant cadre is being phased out and it is planned to start a health inspectors' course run jointly by the National Health Institute and the University of Botswana in 1992. There is also competition for existing resources. As we have explained, FWEs are often needed to fill staff shortages at clinics, to help with the dispensing of drugs, and to participate in other health programmes.

9.12 Under Strategy Option 3, MoH's health education unit should play a major role in the development of the initial education 'package' and subsequent production of supplementary material. However, its resources are currently not sufficient. At present the HEU has just three health educators and two information officers; several positions are vacant. HEU is also short of capacity for material production. Although it has a recording studio, there is no technician and the unit has only two radio slots a week. In terms of graphic production the unit has six posts but the incumbents of two of these are on study leave and one post is vacant. The remaining staff are unable to cope with the present workload.

9.13 At present, the NRSP cannot rely on the HEU to provide the technical resources for the education strategy. HEU attempts to plan its work on an annual basis and allocate its resources according to requests from various departments and programmes of the MoH. Although to a large extent it operates on a 'first-come first-served' basis, giving all programmes equal priority, it will naturally concentrate on the programmes of MoH, its own parent ministry, and not on such MLGL/council programmes as the NRSP.

Options for Strengthening Health Education Resources

9.14 If there is going to be greater emphasis on health education activities it is quite clear that health education resources within the councils will have to be strengthened.

9.15 As explained in Chapter VIII, a fundamental part of the strategy should

be to strengthen the coordination between WHEP, CDD and NRSP. A re-focused NRSP will have much in common with the two other programmes in terms of educational content. A coordinated plan would help to identify areas of commonality, such as the production of joint materials, which would help to concentrate the limited resources that are available.

9.16 If this coordination is achieved then the NRSP should seek to build on the CDD programme efforts to strengthen the health education capacity of the council health departments. CDD intends to educate and train all health personnel on the use of oral rehydration therapy. Its training programme includes the development of two training teams, one at Princess Marina Hospital and the other at the Francistown Hospital, the training of all district health teams, and eventually the training of all clinic and health post staff. An integration of programme messages would enable the NRSP to build on this training activity and link it into the education campaign.

9.17 At the council level there a number of options for strengthening health education resources:

(a) ***Training health assistants in education methods.*** Health education is currently included in their pre-service training but it is not the major focus. The training should be practical and based on the education activities of the NRSP.

(b) ***Re-training and re-orienting FWEs*** back to their original community education role. While this is an aim supported by MoH it is likely that, as long as the shortage of trained nurses persists, clinic-based work will continue to feature prominently in the FWEs' duties. Thus FWEs should have a role in a sanitation education programme, but its scope needs to be realistically assessed. Various studies on FWEs (Manyeneng 1982; Omondi et al 1986) have estimated that they spend about half their time on community work. The NRSP should not expect to have a greater input of time from FWEs than this, and should in some places probably assume much less. It will therefore be essential to maximize the effectiveness of this input by defining specific roles and activities for FWEs over an agreed period of time. In short, manageable and realistic targets will have to be set for FWEs and other health workers involved in the programme.

(c) ***Drawing on the resources of the schools*** to extend community coverage. WHEP's efforts to promote School Health Clubs could strengthened by involving them in the community education programme (eg popular theatre). Equally the materials developed for the community campaign might also be used in the schools.

(d) ***Utilizing community resources*** in addition to the government extension network. The NRSP should build a network of community groups and voluntary and non-government organisations[1/], such as the BCW and Red Cross. In those villages where such NGOs are strong enough councils might even consider contracting-out specific tasks to them. They would be encouraged to work with the education 'package' and would receive the same training assistance that would be given to government extension workers.

(e) ***Involving Tirelo Sechaba participants*** as community animateurs in the education campaign. Although young and for the most part inexperienced, with suitable training they could augment the activities of the local health workers or work with NGOs where appropriate. Experience elsewhere suggests that when properly motivated and supported they perform as well as other development professionals.

(f) ***Creating a cadre of unpaid sanitation volunteers.*** This is not considered a sustainable option. MoH's experiment with unpaid volunteer Community Health Workers (based on the original FWE model) has not been successful.

(g) ***Using expatriate volunteers to fill key professional and technical gaps.*** The KFW-funded part of the project in Central district has utilised expatriate volunteers[2/] who have provided an effective means of overcoming manpower shortages. Despite the existing concentration on construction, the KFW project has had some success in involving community groups in health education and social mobililsation.

9.18 Within central government the production capacity of the HEU needs to be strengthened. This can be done by:

(a) ***Basing the education 'package' on materials and methods that have been developed for similar programmes elsewhere.*** Priority should be given to building up the necessary stock of information from other programmes.

(b) ***Recruiting additional personnel for the HEU.*** The HEU has until now recruited people with a health training background but there

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1/ This could build upon the existing efforts by UNICEF to establish an inventory of community volunteer organisations and develop a strategy for mobilising these to assist in health education.

2/ Three UN volunteers and three counterpart staff are responsible for implementing the KFW-funded part of the project.

is a need to strengthen its capacity in terms of communication skills. Since ULGS may have more latitude in recruitment than MoH, ULGS could recruit personnel and second them to HEU with a specific brief to work on sanitation-related material.

(c) ***Contracting-out part or all of the production work*** on the 'package'. This would help to speed up the production process and would enable the HEU to recruit expertise as and when needed. There are at least eight independent commercial artists and advertising agencies in Gaborone and several more in Francistown, and all printing firms have a design as well as a production capacity.

Overall Manpower and Training Needs

9.19 There are differences in the manpower requirements of the three strategy options, but none of them requires substantial increases in manpower or training. In each case there is a need to fill gaps and, under Option 3, to re-orient the activities of existing staff and make more use of self-help. Precise differences in manpower requirements are discussed in Annex D.

9.20 An important result of deciding upon an agreed strategy will be to sensitise ULGS to the overall manpower and training needs of the NRSP. The minimum requirements for council health departments to implement the NRSP should be distinguished from the requirements of such other responsibilities as refuse disposal.

9.21 Implementating the health education component of Strategy Option 3 does not call for the creation of a new cadre of extension workers but for a fuller utilization of existing manpower. In general the necessary manpower already exists. At the community level there are FWEs, health assistants and enrolled nurses, as well as more senior nurses. Each of these cadres can have a role in a community based education programme. The main challenge under Option 3 will be to re-orient health workers, including nurses, to fully participate in health education aspects, and to secure substantial involvement from community groups.

Overall Programme Coordination

9.22 In considering the various aspects of the strategy, we have identified a series of weaknesses in coordination which need to be overcome. Once the aims, objectives and context of the NRSP have been agreed, the assignment of responsibilities between the various agencies will become clearer and that this will make coordination easier. As we have explained in Chapters III and

IV, we expect MLGL to retain overall responsibility for management of the NRSP; MoH will supply professional and technical guidelines and standards relating to health aspects; councils will implement the project, and; various other agencies including DWA and DTRP will be regularly consulted about overlaps between their responsibilities and those of the NRSP.

9.23 Some possible improvements in coordination are summarised below.

- ***Permanent Steering Committee (all strategy options)*** to take overall charge of managing the programme; unfortunately such committees usually lose momentum due to poor attendance and attendance by officials who lack decision-making powers.

- ***Technical Sub-Committee of Primary Health Care Committee (Strategy Option 3)*** to coordinate health education programmes and advise on technical and professional aspects; the same remarks apply to this steering committee.

- ***Private Sector Development Group (Strategy Options 2 and 3)*** to draw on the technological expertise of the private sector and generate commercial interest in the manufacture and supply of approved types of toilet facilities; if organised by BOCCIM it would stand a chance of attracting private sector support, but not if organised by and dominated by public officers.

- ***Primary Health Care Coordinator (all strategy options)*** to ensure day-to-day coordination of all primary health care activities which fall under the portfolio responsibility of MLGL but rely on technical and professional inputs from MoH. Creation of this essential post is already being considered by MLGL and MoH, but there have been delays in determining the job description.

If any of these possibilities is adopted care will need to be taken to ensure that the coordination arrangements only involve a small number of key agencies, and that other agencies should only participate on an occasional basis.

X MONITORING AND EVALUATION

Existing Monitoring and Evaluation

10.1 As explained in the Cost Analysis, monitoring of latrine construction activities and expenditures by councils is already well organised. We do not consider it necessary to make changes in the system. However, apart from the KAP study, there has been little monitoring and evaluation of environmental health needs and impacts, and none on a regular basis. Since the purpose of the NRSP is to address sanitation-related health needs it is essential to establish some form of monitoring system which would provide information on the levels and degree of need in different areas (which are needed for programme planning) and on the impact of health education activities. This will be important under Strategy Option 3.

Improving Health and Environmental Hygiene Aspects

10.2 The system for monitoring of health and environmental hygiene impacts needs to be simple and easy to implement and administer, so as to be a help rather than a burden to health education staff. The following aspects should be included:

- councils should establish a register of plots with NRSP and non-NRSP toilet facilities, which should be easy to update;
- periodic monitoring of health and sanitation status of households should be based on a small number of key variables which will give a broad indication of status without requiring sophisticated analysis or highly qualified staff;
- there may be a case for monitoring epidemiology inputs as well, to develop a better appreciation of the importance of latrines in the chain of causality regarding diarrhoea, and to contribute to the development of appropriate monitoring variables.

10.3 The success of any monitoring system is based on ensuring that the information which is collected and analysed is useful. All too often evaluation systems fail because of too much information. The development of monitoring and evaluation procedures for the sanitation programme must ensure that these are simple and selective, and that they can be implemented in terms of data collection, analysis and use. This will also have to meet the needs of different users, notably council implementing departments, the technical units in MLGL and MoH and the financing agencies involved.

10.4 Additional monitoring and evaluation of health and environmental hygiene aspects should focus on:

- the health education materials;
- the education and communication process;
- the impact on individuals and households.

Each of these is discussed briefly below, along with suggestions of some possible indicators that might be used to assess impacts.

10.5 ***Effectiveness of materials.*** Educational materials must be appropriately designed in terms of content and presentation. Testing the public response should therefore be included as part of the material development process. Since HEU has experience in pre-testing of health education materials, it should be responsible for such testing.

10.6 ***Education and communication process.*** The appropriateness and standard of the health education delivery system will be of central importance to the success of the overall strategy. Monitoring the quality of training, the quality and frequency of the educational interventions, the reliability of back-up support etc. (eg reliability and timeliness in the provision of educational materials) will be important for securing an acceptable level of performance in the education campaign, and providing feedback to the districts and central technical units on how the campaign strategy might be improved.

10.7 ***Impact on individuals and households.*** The ultimate measure of the effectiveness of the education strategy is the impact it has on the health standards of individuals and households. The criteria for measuring this impact should be related to the specific objectives defined for each of the educational messages. The methods for measuring this impact could include:

- a baseline survey of household sanitation facilities (before and after the campaign);
- field tests on knowledge and practice related to specific messages (eg availability of ORS packets in homes and mothers' knowledge on use).

10.8 The approach to monitoring and evaluation should be standardised. The technical support units should have responsibility for the design and testing

of the tools and procedures involved, as well as for incorporating them into the educational package and for training district staff. As far as possible, council health departments should be responsible for implementation of monitoring and evaluation activities. This means that council sanitation units, normally headed by health inspectors, should be capable of supervising the activities of field staff and undertaking simple baseline impact surveys, where necessary with the support of specialists from the technical units. Councils should provide annual reports to MLGL and MoH on monitoring of health and environmental hygiene aspects and these should be compiled into a national annual report. This reporting system should be complemented by the holding of periodic inter-district workshops.

Exhibit 10A: Examples of Evaluation Indicators

Objective	Source	Method
Impact Indicators:		
Reduction in the incidence of diarrhoea	Clinic records[1/] Households	Comparison of before & after campaign records, baseline survey
Increased availability of ORS packets in households	Households	Before & after baseline survey
Improved ability to prepare ORS	Households	Random testing of mothers
Increase in toilet hand washing facilities	Households	Random inspections
Increase in number of VIP-type latrines	Households	Before & after baseline survey
Improved maintenance of toilets	Households	Random inspection
Process Indicators:		
No. of training events for FWES & volunteers	Extension workers	Supervisors/trainers reports
No. of talks/home visits made by: • FWEs • volunteers	Extension workers	Monthly reports, suipervisors visits & de-briefing workshops
Ability of community animateurs to convey messages	Community animators	Knowledge test on messages
Number of participants at: • community workshops • theatre gatherings • FWE talks	Extension workers workers	Monthly/quarterly reports compared to expected targets

1/ It is generally accepted that clinic records are unreliable but they will provide a rough guide.

Reviewing Performance of Programme Strategy

10.9 The programme strategy should include a clear statement of aims and objectives expressed in measurable terms. The objectives will provide the basis for periodic reviews through a workshop process. A major purpose of review workshops will be to share experience between the districts, and to make revisions to the strategy based on direct field experience. Data from the field reports should be available to complement these perceptions.

10.10 Under Strategy Option 3, a series of changes will have to be introduced in order to improve and expand health education and to develop a range of better technologies. We recommend that once after these have been prepared and tested on a pilot basis, government should commission an independent evaluation of the expected effectiveness of the programme strategy. This should help to ensure that any necessary modifications are made before implementation moves forward at the national level.

XI PLAN OF ACTION

Choosing the Strategy

11.1 In the preceding chapters we have shown why there is a need for a programme strategy for the NRSP. We have outlined the three strategy options, which are available and stated our conclusions that Strategy Option 3 should be adopted. This entails a radical shift in emphasis to health education, the development of a better, more affordable range of technologies and the phasing out of latrine construction subsidies.

11.2 Before this or any other strategy can become settled policy it will first be necessary to achieve a better awareness of rural sanitation issues among politicians, senior officials and the community at large. Whilst the extent and manner in which any policy entailing withdrawal of subsidies should be opened up to public debate is a matter for judgement at the political level, we would suggest that it will be important to involve as many people as possible; we have suggested that a series of workshops should be held for this purpose during 1991 and 1992. Government could then be in a position to approve a strategy in the second half of 1992. Some or all of the following activities could be included in the consultation process:

- ***Workshop to sensitise key decision makers:*** to involve politicians, senior officials, leaders of community groups and non-governmental organisations, local and international experts; and be publicised in the local media;

- ***Seminars at district and national levels:*** to involve council secretaries and department heads;

- ***National District Development Conference, 1992:*** for discussion and selection of the strategy;

- ***Goverment approval of the strategy:*** by Parliament, a cabinet decision or ministerial approval;

- ***Promotion of the approved strategy:*** to involve politicians and community leaders.

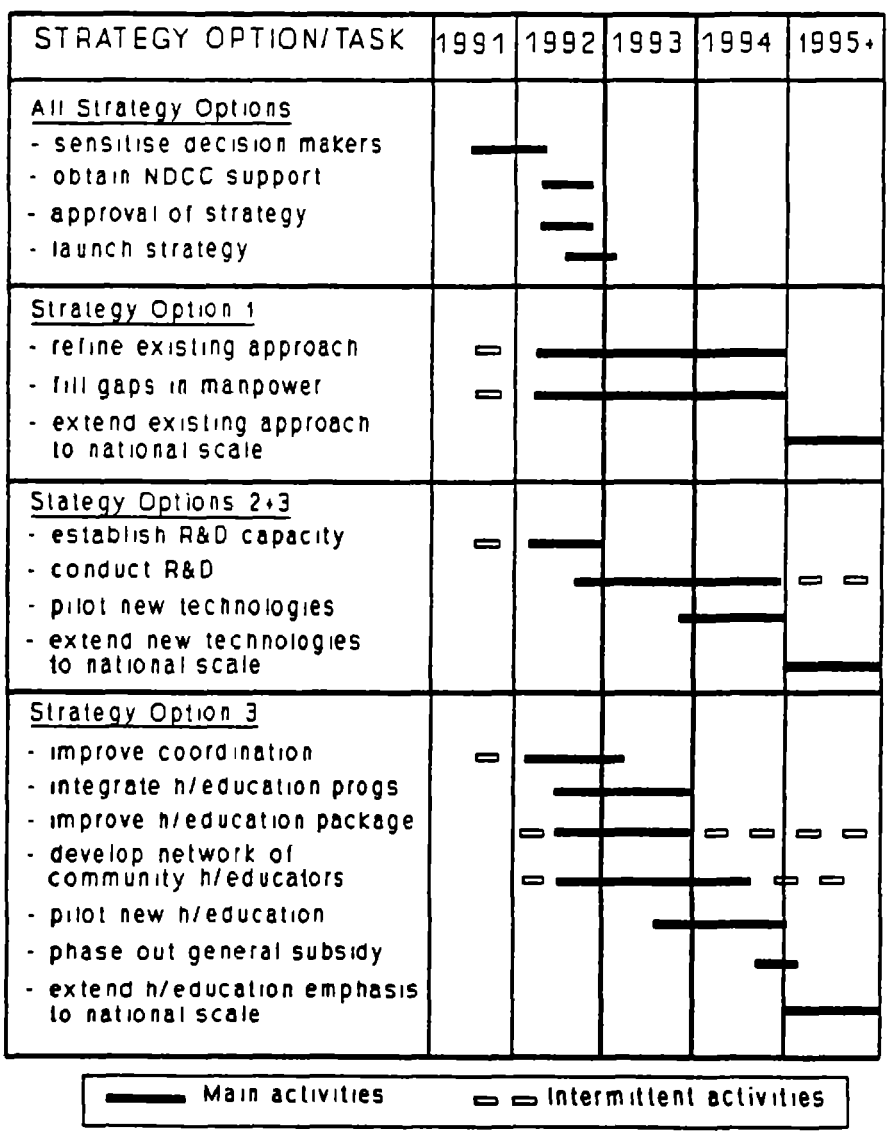
11.3 After approval by the Minister of Local Government and Lands, the detailed development of the strategy should involve a consultative inter-agency and inter-district planning workshop. The central technical units in MLGL and MoH would be responsible for organizing the workshop and presenting the broad framework of the strategy. This should then provide the basis for discussion of detailed aspects, particularly the problems which may be

encountered by implementors. A sanitation strategy to be implemented by councils will only be successful if they take the lead in its formulation, determining what is possible and what resources they are prepared to commit.

Timeframe

11.4 We have expressed the plan of action in the form of a timetable for establishing the strategy. In view of the need to generate interest and commitment to the strategy process while simultaneously conducting various preparatory tasks, we envisage that the tasks of establishing the strategy will take until the end of 1994. Full implemention would then be possible from 1995 onwards. This timetable is shown in Exhibit 11A.

Exhibit 11A: Timetable for Establishing the Strategy



Projected Performance and Costs

11.5 All three strategy options have implications for the costs of the NRSP and the distribution of costs between government agencies and households. We have prepared separate cost projections for each of the options, using a computer-based cost projection model which was developed for the Cost Analysis. The projections necessarily involve some speculative assumptions about the detailed composition and performance of the strategy options. In particular, we have assumed that under Strategy Option 3 the increase in public awareness through improved health education would be sufficient to maintain the level of NRSP-generated latrine construction which has been assumed for the other two strategy options. In practice, there might be some shortfall in early years, followed by an acceleration in construction once a significant change in public awareness and expectations has been achieved. We consider that the projections are adequate for identifying the overall nature of changes in project costs which need to be considered when approving the strategy.

11.6 The main cost assumptions are explained in Annex D and the cost projections are presented in Annex E. Key assumptions are:

- ***All strategy options:*** the process of agreeing the strategy and developing the approach will take until the end of 1994, and implementation of the revised approach will commence in 1995;
- ***Strategy Option 1:*** existing approach, but allowance for the costs of establishing as an agreed strategy;
- ***Strategy Option 2:*** similar to Option 1, but includes the costs of developing improved technologies; assumes also that the improved technologies will lead to a 50 percent reduction in the average direct costs of latrine provision (including a low cost technology option costing no more than, say, P 300) and that the new technology eliminates the emptying costs;
- ***Strategy Option 3:*** similar to Option 2 for technology aspects, but also entails costs of developing a new approach to health education; an increase in council health education activities; envisages the transfer by 1995 of all latrine construction responsibilities to households; and elimination by 1995 of general subsidies and registration fees.

In the following sections the cost projections are expressed in constant 1990 prices, for ease of comparability with the Cost Analysis. Estimates in

current prices are also provided in Annex E.

11.7 The cost projections indicate that there would be incontestable advantages in adopting Strategy Option 3. To achieve a comparable result in terms of achieving a 60 percent latrine coverage from 2010 onwards, Option 3 would cost about P 100 million in the twenty-five year period between 1995 and 2020; this is about half the projected cost of Option 1. Although Option 2 would offer similar savings, most of the costs would still be met by government under this option, whereas under Option 3 they would be mainly met by householders.

Exhibit 11B: Projected Performances and Costs of Strategy Options

Performance/ Cost Aspect	Unit	*Option 1* Existing Approach	*Option 2* Improved Technology	*Option 3* Overall Change of Emphasis
Latrine coverage by 2010	Percent	60%	60	60%
Latrine building from 1995-2010	Latrines per annum	4,029	4,029	4,029
Average latrine cost	Pula (1990 prices)	P 1,650	P 1,000	P 1,000
Total costs from 1995-2020[1/]	P million (1990 prices)	P 186m	P 97m	P 101m
Total government cost, 1995-2020	P million (1990 prices)	P 143m	P 76m	P 38m
Total private cost, 1995-2020	P million (1990 prices)	P 43m	P 21m	P 63m

11.8 While these projections are indicative only, they demonstrate that a shift in emphasis to health education and introduction of better technologies can reduce costs and reduce the reliance of households on government subsidies. The real bonus of Option 3 of course is the non-monetary one of a greater impact on overall public health as a result of better public awareness about sanitation and environmental hygiene practices.

1/ This is the period of full implementation of each strategy option, after the existing approach is replaced in 1995. Cost projections inclusive of the period from 1990 to 1994 are also provided in Annex E.

ANNEXES

ANNEX A

TERMS OF REFERENCE

The consultants will undertake, but not necessarily limit themselves to the following:

The production of a strategy document for the National Rural Sanitation Programme, with the objective of setting out policy guidelines and an implementation framework for the development of a nationwide programme during the course of the NDP7 plan period and beyond.

In particular, the document will be used as a reference document by the Ministry of Local Government and Lands for coordinating programme planning, implementation, monitoring and evaluation. It will be extensively used in preparing the programme for the NDP7 plan period. The document will also be used by the district councils in guiding programme development in their respective districts, and will support the preparation of annual and district development plans. The Ministry of Finance and Development Planning will also use the document for sector planning and budgeting purposes and to support discussions on technical cooperation with the donor community.

The strategy document will be prepared in such a way that it can be periodically updated and revised, and must therefore be prepared with a flexible approach in mind. In this respect, while the paper will include definitions of programme goals and objectives, and recommend the best means to achieve these, it will also identify those necessary actions required to ensure that the minimum institutional capacity for implementation of the recommended delivery approaches is attained. As such, the consultants will be expected to identify existing constraints to programme implementation and prepare a plan of action to support the recommended approaches.

The strategy paper will cover the following issues which will be presented as separate sections in the report document:

1. Definition of Aims and Objectives

   Currently, there is no formal strategy or policy statement which defines the general and specific aims, objectives and scope of the programme, such as target group, levels and scope of coverage, subsidy and cost recovery, and desludging. Clear definitions are required as the basis for preparing guidelines for the various sections of the paper which follow, as well as for defining the programme more generally in the context of the overall sanitation sector.

2. The Context of the National Rural Sanitation Programme (NRSP): Rural Development/Primary Health Care/Water & Sanitation/Environmental Protection.

The NRSP constitutes a component of primary health care and contributes to Government efforts to control the incidence of diarrhoeal related diseases in the country. Sanitation sector activities are also closely linked to developments in the water sector, namely through the control of wastewater, protection of groundwater and through support of the goals of the UN International Drinking Water Supply and Sanitation Decade. The NRSP is also regarded as a component of local authority's programme for providing service infrastructure to the rural population. The NRSP also shares common features with its counterpart low-cost sanitation programme for low-income urban areas. It is therefore necessary to review and define the context within which the NRSP operates and identify comparisons and contrasts, and possible areas of complementarity and conflict.

3. The Overall Approach to Programme Delivery: Role of the Public and Private Sector/Community Participation/Institutionalisation.

During the pilot phases of the programme, a project delivery methodology was developed with requires inputs from central government, local government and the household beneficiaries. Variations to a standardised approach have however been developed to account for management, logistic and financial constraints, which allow for different degrees of private sector intervention and community participation. The standardised approach and variations to it need to be fully described and presented in the form of a model which spells out the divisions of responsibility, and which indicates the criteria that should be considered in opting for variations to the standard approach.

4. The Technology: Standardisation with Flexibility/Design Specifications/Affordability and Acceptability/Approaches to Desludging.

The programme is based upon the promotion of a Botswana adaptation of the Blair VIP latrine. Design specifications have been prepared in detail for the substructure, for which a number of alternative modules have been developed to suit different hydro-geological conditions.

The household is however responsible for choosing the type of superstructure it wishes to build. A description of construction procedures and design and material specification is required as well as consideration of the scope for any further improvements to the designs from point of view of cost-saving to government, and affordability and acceptability to the household.

In principle, the latrine has been designed to permit periodic desludging by manual and mechanical methods. While the consultant will not be expected to develop an appropriate technology for desludging, the advantages, constraints and feasibility of the adoption of different levels of technology should be clearly examined from the point of view of cost, logistics and social acceptability. In this context, the possible merits of the alternating pit system should be considered. It would also be advantageous to review technologies adopted in other countries, such as Zimbabwe and Lesotho, where similar programmes are being implemented.

5. Health Education and Social Mobilisation: Objectives and Methodology/Roles within the Overall Programme.

Health education is a major component of the NRSP, serving first to support the construction of VIP latrines through social mobilisation and through instruction and guidance to householders on proper operation and maintenance of facilities, and second to promote linkages between the NRSP and associated primary health care programmes, such as water hygiene and the control of diarrhoeal diseases. Support to health education is generally obtained through the established primary health care delivery system, serviced by the Ministry of Health and the Ministry of Local Government and Lands at the central government level, and by the District Health Teams at the local authority level. The general and specific objectives of the health education component of the programme and the means to be used (human resources and techniques) to meet those objectives, therefore need to be defined. A strategy for health education should be prepared based on the findings drawn from the Knowledge, Attitudes and Practices Study.

6. Implementation Capacity: Determination of Minimum Requirements for Manpower, Transport and Equipment.

The attainment of programme goals and objectives will depend on the availability of adequate implementation capacity at the central government and local authority levels. Depending on the programme

objectives that are defined in section 1, and the recommended delivery systems presented in section 3, a model should be developed which indicates the minimum staffing levels and logistic support that will be necessary for the programme to be a success. In particular, it must stipulate minimum manpower requirements at all levels, advising on the need to create, fill or re-orientate existing posts and recommend in-service and other training programmes that may be required. Transport and other logistic support requirements must also be considered within the model, as well as an organisation chart highlighting vertical and horizontal linkages. An action plan to support the recommended model should be provided.

7. Monitoring and Evaluation

Basic procedures for quarterly reporting of project finances and progress in construction activities have been established. Proposals for extending these monitoring procedures to embrace other components of the programme, which would assist programme planning and coordination, such as health education impact assessment and matching actual implementation with targets set, should be considered. Guidelines on suitable indicators for programme 'success' should also be developed.

8. Plan of Action: Physical Targets and Financial Projections (High-Medium-Low Scenarios).

Based upon the aims and objectives defined above, it will be necessary to produce financial and physical output projections. Separate projects for selected low, medium and high implementation target scenarios should be presented for consecutive five year periods up to 2030 and separately for the NDP7 plan period. The financial projections should distinguish between capital and recurrent expenditures incurred by central government and the local authorities, and the costs incurred by the household. These should be presented in constant and current prices, and should be based upon data presented in the Cost Analysis study. The figures should also be disaggregated on a district by district basis. A budget for research and training activities should also be prepared.

9. Other Policy Matters

A number of supplementary strategy issues need to be defined and incorporated into the overall strategy. These include a strategy for

addressing the needs of destitutes, other social groups who for reasons of affordability may be unable to participate in the mainstream programme, and households who may wish to upgrade their latrines to VIP standard. The feasibility of means-testing higher income groups, in order to introduce an income-linked subsidy system or a cross-subsidisation mechanism should be considered. To this effect, criteria for identifying different income groups eligible for the programme should be worked out by the consultants.

The strategy paper will contain an executive summary containing highlights of the chapters and conclusions. There will also be a separate list of recommendations and an action list.

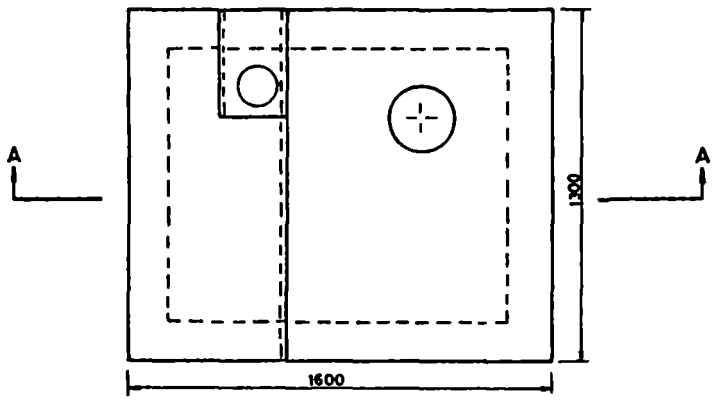
PRINCIPAL PERSONS CONSULTED

Organisation	Person	Position
BTC	Mr J Diphaha	Managing Director
CDC	Mr V Mogotsi	Council Secretary
CDC	Mr C Chesenga	Senior Health Inspector
CDC	Mr A M Habana	District Sanitation Coordinator
CDC	Mr E R Rambacal	KFW Project Coordinator, Mahalapye
CDC	Mr J S Leimela	KFW Project Counterpart, Mahalapye
CDC	Mr J S Bockarie	KFW Project Coordinator, Palapye/Tonota
CDC	Mr Velaiyutham	KFW Project Coordinator, Serowe
CDC	Mr K Riordan	Building Adviser
CDC	Mr R Surie	Chief Architect
CDC	Mr W Choto	Social Welfare Officer
GCC	Mr S Pathmanathan	City Engineer
KGDC	Mr R Mogodi	Senior Health Inspector
KWDC	Mr K G Ntsatsi	Councillor, Thamaga
KWDC	Mr J Lebeko	Councillor, Letlhakeng
KWDC	Mr F Klausen	Senior District Medical Officer
KWDC	Mr F Masenya	Chief Health Inspector
KWDC	Mr K C Mpedi	Senior Council Planning Officer
KWDC	Mr V M Olesitse	Senior Techical Officer
KWDC	Mr K Gabarongwe	Village Sanitation Coordinator
KWDC	Mrs M K Bone	Family Welfare Educator
KWDC	Ms B Mohotlhoane	Senior Health Assistant
KWDC	Ms K Bontsaii	Village Sanitation Coordinator
KWDC	Mr T Sithole	Assistant Physical Planner
KWDC	Ms T Mbewu	Senior Social Welfare Officer
MFDP	Mr M Kenosi	Planning Officer
MFDP	Mr H Pearce	Rural Development Coordination Division
MLGL	Dr A M Land	Water & Sanitation Project Officer
MLGL	Mr M Pilane	Planning Officer
MLGL	Mr H Ruud	Council Architect
MLGL	Mr F Van Der Geest	Water Engineer
MLGL	Ms T Kedikilwe	Assistant Sociologist
MoH	Mr Lesetedi	Coordinator of Programmes, Family Health
MoH	Mr T Pule	Head, Environmental Health Unit
MoH	Mr T Mphele	Health Education
MoH	Mr G Miles	District Management Improvement Project
MoH	Mrs W Manyaneng	Asst. Director, Primary Health Care
MoH	Mrs Mabona	Primary Health Care Support Unit
MoH	Ms R Mandevu	Principal Community Health Officer
MoH	Mrs M Enge	Consultant, WHEP
SIDA	Mr L O Hook	Programme Officer

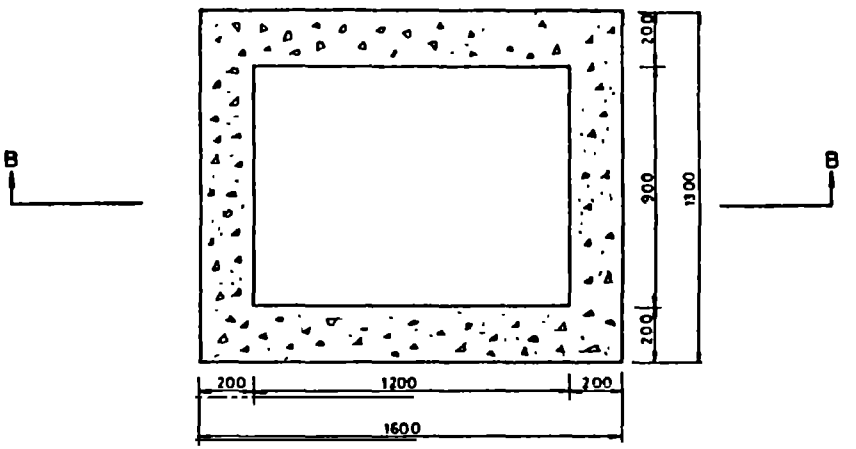
UNICEF	Dr I Ndombi	Special Adviser
SDC	Mr E Valema	Senior Health Inspector
SDC	Mr Rutherford	Health Inspector
SDC	Mr V Orapeleng	District Sanitation Coordinator
SDC	Mr C Setlhabi	Buildings Department
SDC	Ms E Gower	Senior Nursing Sister
SDC	Mr S Sekwakwa	Senior Planning Officer
SDC	Ms A M Khiba	Social Welfare & Community Development

ANNEX C

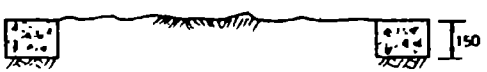
EXISTING LATRINE DESIGNS



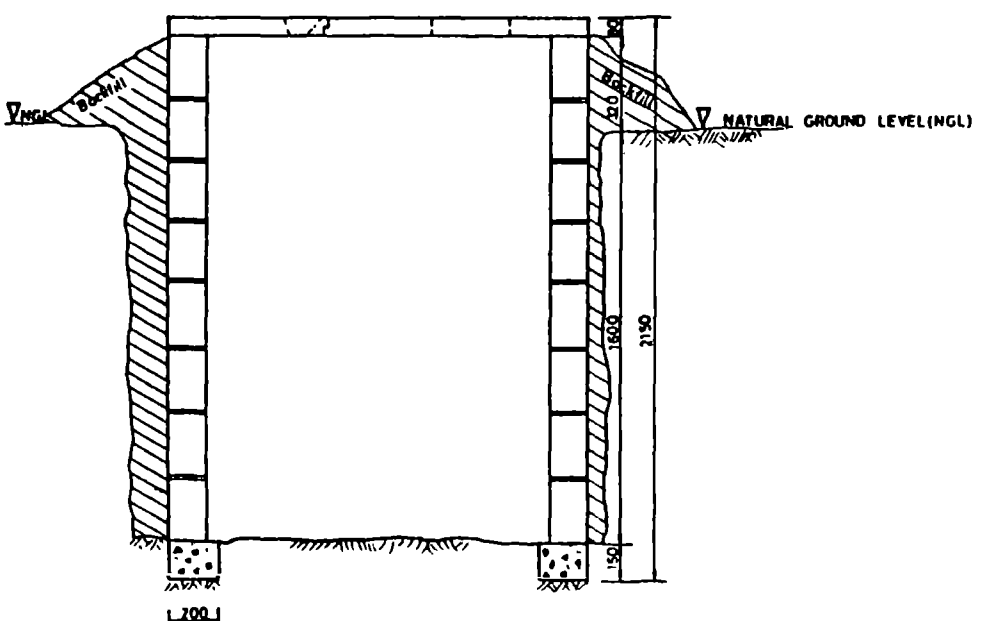
PLAN



PLAN OF FOUNDATION



SECTION B-B



SECTION A-A

0 500mm 1000mm

NOTES 1) All dimensions in millimetres.

2) Pit excavation to be 1800x1500x1500 deep

3) Strip foundation to be 200-wide x 150 deep of 25 MPa concrete Excavation for strip foundation extra below pit excavation

4) Cement blocks to be 450 x 150 x 230 good quality hollow blocks, eight courses required

5) Vertical joints on bottom five courses of blockwork to be open(no mortar), top three courses to have mortar in vertical joints

6) Backfill must be properly compacted(tamped) with well graded material

7) See drawing LG LAT 02A for slab details and LG LAT 03A for superstrucre details

MINISTRY OF LOCAL GOVERNMENT AND LANDS

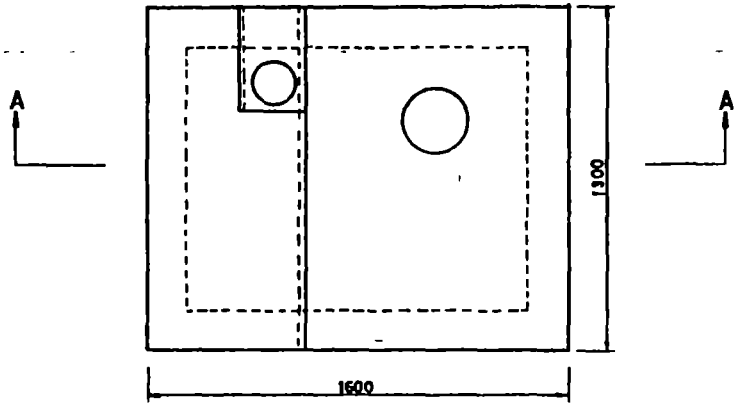
LINED TYPE RECTANGULAR SINGLE PIT LATRINE

SCALE AS SHOWN

DESIGN J GADEK

DRAWN BY

DATE JUNE 1988



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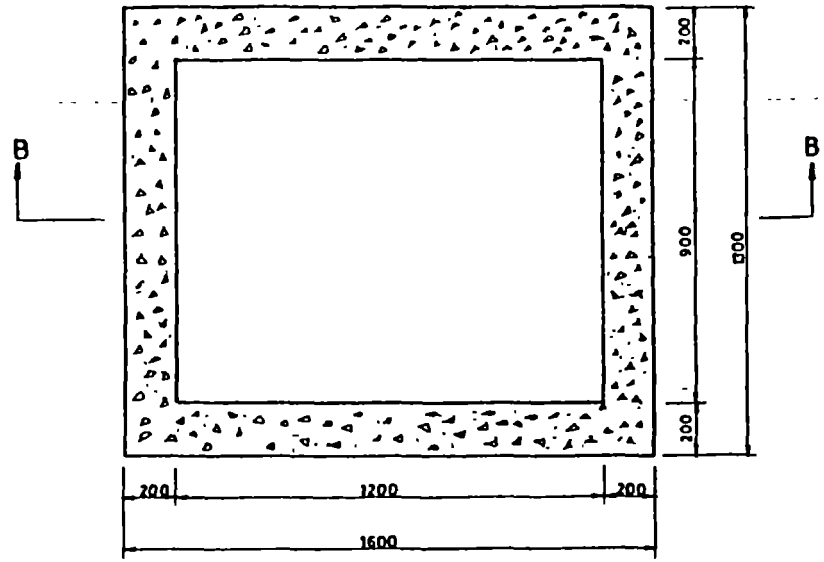
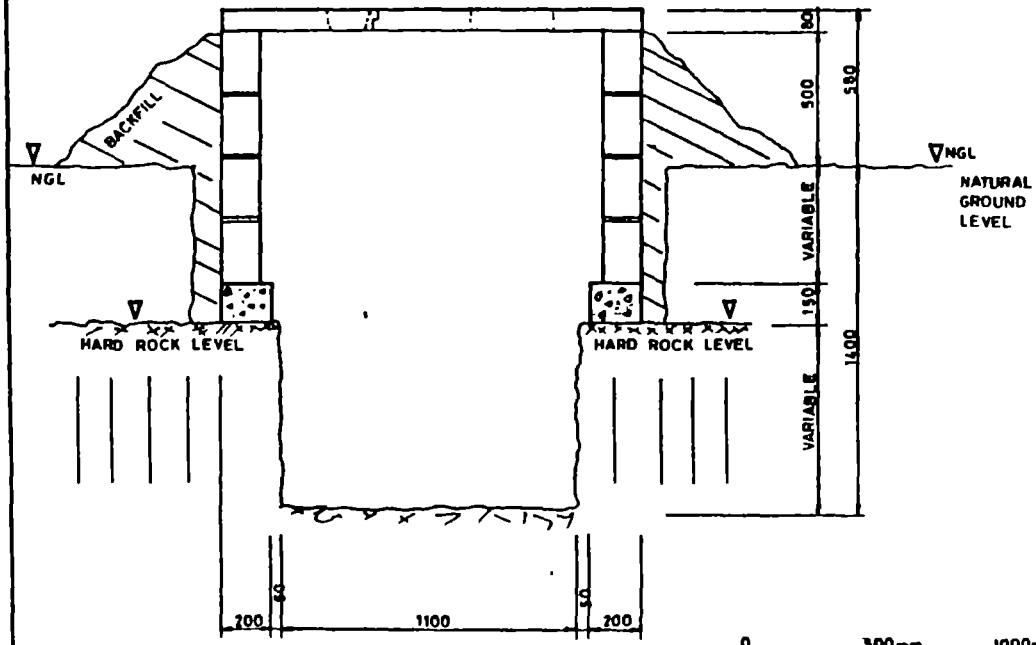
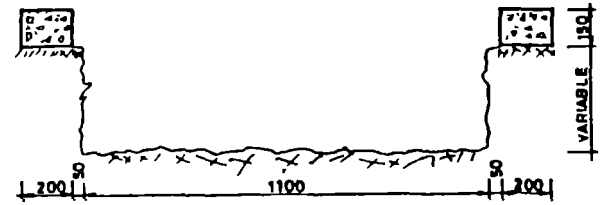


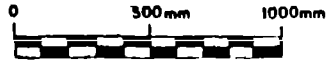
PLAN OF FOUNDATION



SECTION A-A



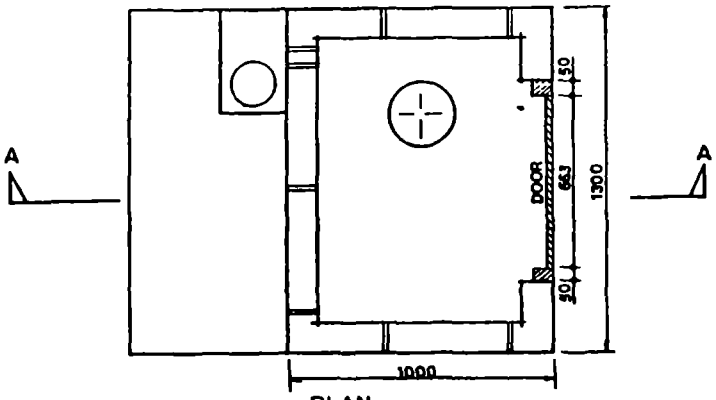
SECTION B-B



SCALE BAR(1:20)

NOTE
1 All dimensions in millimetres
2 Pit excavation to be 1800 x 1500 x depth to hard rock level (variable). From hard rock level downwards pit excavation to be 1100 x 900 x depth to complete latrine depth to 1900 depth (variable).
3 Strip foundation to be 200 x 150 deep of 25 MPa concrete
4 Cement blocks to be 450 x 150 x 230 good quality hollow blocks number of courses variable depending on depth to hard rock
5 Backfill must be properly compacted (tamped) with well graded material
6 See drawing LG LAT 02A for slab details and LG LAT 03A for superstructure details

MINISTRY OF LOCAL GOVERNMENT AND LANDS	SCALE AS SHOWN
	DESIGN J GADEK
	DRAWN BY -
LINED TO SOLID ROCK SINGLE PIT LATRINE	DATE JUNE 1980
SUBSTRUCTURE DETAILS	DRG No. LG LAT 01C



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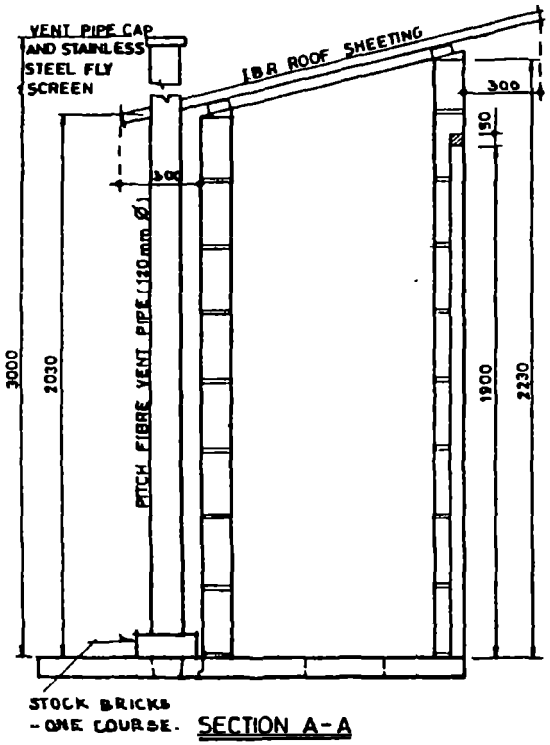


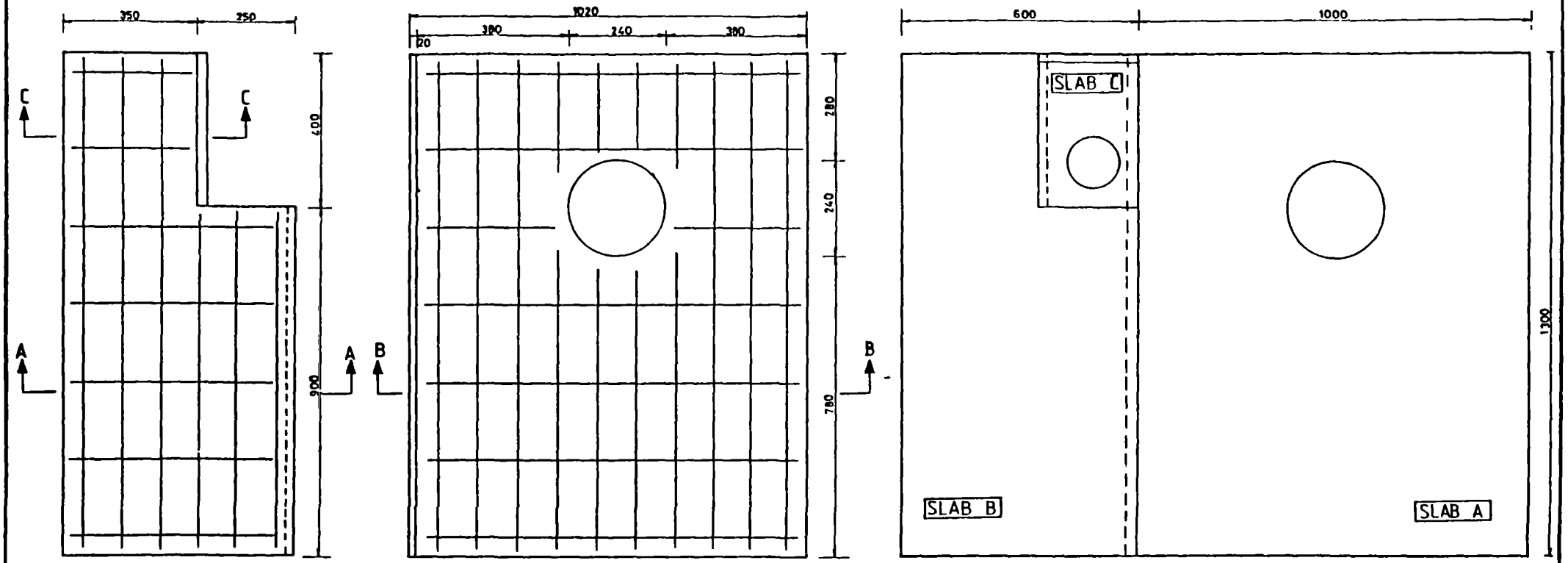
SECTION A-A

SCALE BAR (1.20)

Notes

1) All dimensions in millimetres.
2) Superstructure walls to be built with 450×115×230 cement blocks or other suitable bricks It should be noted that 115mm is the maximum allowable width of superstructure blocks, wider blocks will inhibit the proper placement of seat unit.
3) Cement mortar will be used to bond the bricks
4) The door frame will consist of 50×80×1900 vertical wooden members and one 50×80×900 horizontal lintel.
5) The door will be 662 wide 1880 high×25 thick. Two hinges and a simple handle will be required. Door to open outwards
6) Roof sheeting will be IBR profile with an effective cover width of 686mm, manufactured of galvanised steel. Two sheets of 1600mm length will be required
7) The roof sheeting will be nailed to two wooden beams 50×80×1200. These beams will be securely wired to the brick walls
8) Exterior wall faces to be plastered, interior walls to be coated with cement slurry mix Plaster and brickwork to go to underside of roof sheeting
9) The pitchfibre ventpipe will be secured to the blockwork near the top, and mortared at the bottom berween stock bricks
10) A brickwork seat base 400 high is to be constructed around the hole A plastic or fibreglass seat is to be installed on base. The brickwork is to be plastered

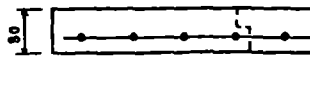
MINISTRY OF LOCAL GOVERNMENT AND LANDS	SCALE AS SHOWN DESIGN J GADEK DRAWN
RECTANGULAR SINGLE PIT LATRINE SUPERSTRUCTURE DETAILS	DATE: JUNE 1988 DRG No.LG LAT 03A



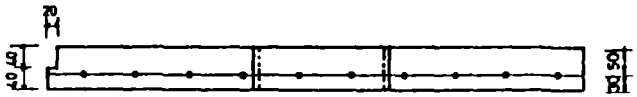
SLAB B

SLAB A

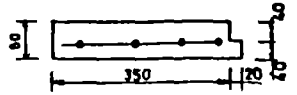
PLAN



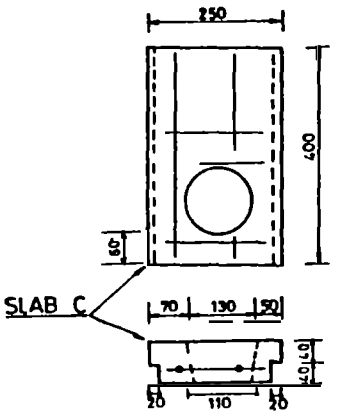
SECTION A-A



SECTION B-B



SECTION C-C



Notes 1) All concrete to be high-grade structural concrete mix (25MPa)

2) Steel reinforcing to be 6.3mm x 5.6mm welded mesh Reference Nº 341

3) No reinforcing to be exposed All reinforcing to be at least 20mm inside concrete edge.

4) Top of slabs to be of good quality, trowel finish.

5) All dimensions in millimetres.

6) See Drawing LG LAT 03A for superstructure details

SCALE BAR (1:10)

MINISTRY OF LOCAL GOVERNMENT AND LANDS

RECTANGULAR SINGLE PIT LATRINE

SLAB DETAILS

SCALE AS SHOWN

DESIGN J GADER

DRAWN BY

DATE JUNE 1988

DRG No LG LAT 02A

ANNEX D

COST ASSUMPTIONS

General Assumptions

D.1 Cost projections have been prepared for the purpose of examining the likely financial implications of the three strategy options. The present study was not required to provide detailed project proposals nor to conduct a detailed costing exercise, so we have relied mainly on the cost assumptions and the computer-based cost projection model which were developed in the Cost Analysis. To interpret the cost projections it is therefore useful to refer to the detailed assumptions and methodology included in the Cost Analysis.

D.2 Since NRSP activities under Strategy Option 1 (existing approach) would be similar to those envisaged by the Cost Analysis, we expect that the cost projections for this option are fairly accurate. Under Strategy Option 2 (existing approach, improved technology) a new range of more affordable technologies would be developed, but at present it is only possible to speculate what the unit provision cost of such technologies would be. The cost projections for Strategy Option 3 (health education emphasis, improved technologies) require further speculative assumptions about the extent and costs of health education activities and the savings through reduction in council latrine construction activities. Despite these limitations, we consider that the cost projections are useful in identifying the overall nature of the changes in project costs which might be expected under the different strategy options.

D.3 For all strategy options we have adopted the assumptions used in the Cost Analysis regarding the numbers of households without toilet facilities between 1991 and 2020. As we have explained in the main report, it will not be possible to verify these assumptions until reliable baseline surveys of household sanitation have been conducted.

D.4 For all strategy options we have provided estimates of annual latrine provision costs on the basis of achieving a target level of coverage within a defined period. Under Strategy Option 3 this focus on latrine construction would not fully reflect the overall health impacts of the NRSP, but it is nevertheless useful to examine this for costing purposes.

D.5 Until the end of 1994 the projected costs for Strategy Options 2 and 3 are based on the existing approach, except that allowance is made for the costs of implementing the strategy during this period (ie health education and/or technology development). Cost projections from 1995 onwards reflect

full implementation of the respective strategy options.

D.6 Estimates of costs have been expressed in both constant and current prices. Constant prices are based on mid-1990 prices, which enables direct comparison with the Cost Analysis.

Strategy Option 1

D.7 Cost assumptions for Strategy Option 1 are identical to those used for the Cost Analysis (base case), except that a modest allowance has been made for the additional costs of establishing the strategy. The scale of activities was based on achieving a target level of coverage of 60 percent by 2010 and maintaining this coverage thereafter.

D.8 The projected costs of latrine empyting have been based on the Cost Analysis. This makes the favourable assumption that the present difficulties associated with latrine emptying by vacuum tanker will be overcome. Although projected emptying costs are high, it would be much more expensive if a new latrine had to be constructed each time a latrine became full.

D.9 It has been assumed the costs of establishing the strategy would be about P 150,000. This would be mainly for workshops to sensitise decision makers and community leaders.

Strategy Option 2

D.10 Strategy Option 2 is similar to Strategy Option 1, except that we have made the following assumptions about the costs associated with developing and introducing a range of better, more affordable technologies:

Timeframe: we have assumed that the period 1991-94 would be required for developing and testing a new range of technologies to be used at a national level. We consider that such a timeframe is appropriate as long as the approach to technology development is mainly based on adaptation of technologies being used elsewhere. For the first four years of NDP7 the existing technology would continue to be used (so costs would be identical to Strategy Option 1) but that from the beginning of the fifth year this would be replaced by the new range of technologies.

Research and development costs: a total budget of P 750,000 has been allowed for research and development, and it has been assumed that expenditure would be spread evenly over the four year technology development period. The main cost components are expected to

comprise:

- contract research and development services[1/]
- workshops, visits to neighbouring countries etc
- piloting of prototypes

Unit latrine costs: we have applied a speculative assumption that on average the direct costs of latrine would be reduced by 50 percent in each district. Direct costs include pit excavation, substructure, fittings and superstructure, but exclude council overhead costs which might be expected to remain around existing levels. On this basis the overall average unit cost would be about P 1,000 in mid-1990 prices, although the unit cost of the low cost technology option would need to be significantly less. This overall average unit cost is still substantially higher than reported costs in Zimbabwe, Malawi and Lesotho. The brief for research and development work should make it a specific aim that the average unit cost should be reduced by at least 50 percent, and that the low cost technology should cost no more than, say, P 300.

Latrine emtpying: we have assumed that all improved technologies will either not need to be emptied during their normal lives are will have minimal emptying costs. No costs of emptying have been provided for in the cost projections.

D.11 Since this strategy option does not provide for improved health education and social mobilisation, we have assumed that government subsidies would continue to be needed to encourage public participation. We have assumed that that proportion of unit provision costs which is paid by government will remain unchanged, but that in absolute terms this will be reduced by one half due to the overall savings through the development of more affordable technologies.

Strategy Option 3

D.12 Strategy Option 3 is similar to Strategy Option 2 in respect of the costs of the new range of technologies, but otherwise represents a substantial departure in terms of the shift to an emphasis on health education and the abandonment of the construction programme approach. The following additional assumptions have been applied:

1/ It is expected that such services would be provided by Botswana Technology Centre, Rural Industries Innovation Centre or by a private firm.

Timeframe: we have assumed that the new approach based on a shift in emphasis to health education could be confidently introduced at a national level until 1995. This is because it would take time to develop and pilot improved approaches to health education and to establish the necessary resources for implementation. A further reason is that we have assumed that it will take this length of time to develop the new range of technologies and we consider that these technologies need to be available if expanded health education efforts are have their full impact.

Health Education Development Costs: these will include conducting of surveys, design of messages and materials and piloting of the improved and expanded approach to health education. Much of this work would be operated through the HEU, but we expect that part of these would be contracted-out to non-governmental organisations or private firms. An overall allowance of P 400,000 has been assumed for health education development costs.

Project Overheads and Health Education Costs: based mainly on a district campaign approach to health education and social mobilisation, we have developed some very rough assumptions about council health department inputs. We have retained the existing overheads for supervision and transport, but have assumed that would in future be used for management and supervision of the expanded health education activities. We have developed speculative estimates of the likely increases in unit health education costs, using Kweneng as a model for all districts. Health education materials would cost P 30 per latrine, which is between two and three times the existing level. The low existing inputs for health education would be supplemented by additional inputs from family welfare educators and enrolled nurses. It has been assumed that health education activities would be based on dividing Kweneng into five geographical areas and running a health education campaign in each sub-area once every eight years. During a campaign year the family welfare educators and enrolled nurses of the sub-area would devote 25 percent of their time to the NRSP. However, it is important to note that we have not attached costs to the substantial voluntary inputs which would be required from community groups and non-governmental organisations.

Latrine Construction: we have assumed that households will be responsible for all latrine provision activities and therefore that government not incur any costs for construction. In practice, it is possible that there will continue to be a need for excavation by council compressor in some more remote areas and for council provision for destitutes, but these costs would be quite minor and have been

excluded.

Subsidies and Registration Fee: we have assumed that these will be discontinued when implementation becomes established at a national level and therefore that latrine provision costs will then be met independently by households.

ANNEX E

COST PROJECTIONS
(based on Cost Analysis study, 1990)

TABLE E1 NATIONAL WATER MASTERPLAN POPULATION PROJECTIONS, 1990-2020: SETTLEMENTS EXCEEDING 500 PERSONS EXCLUDING URBAN AREAS a/

Settlement	District Council	1990	1995	2000	2005	2010	2020
Serowe	CDC	34,727	41,601	49,324	59,271	70,494	99,278
Mahalapye	CDC	32,772	40,499	49,283	59,271	70,494	99,278
Palapye	CDC	15,978	20,297	25,220	30,916	37,392	54,403
Tonota/Shashe	CDC	9,596	10,172	10,729	11,304	11,838	12,945
Letlhakane	CDC	9,029	11,476	13,840	16,073	18,255	23,370
Bobonong	CDC	6,161	6,935	7,798	8,768	9,792	12,172
Mmadinare	CDC	6,009	6,336	6,660	6,988	7,250	7,762
Maitengwe	CDC	5,460	6,816	8,328	10,110	12,033	16,883
Shoshong	CDC	5,107	5,478	5,780	6,001	6,148	6,415
Tutume	CDC	4,238	4,423	4,611	4,798	4,931	5,178
Sefhophe	CDC	3,962	5,391	7,042	9,023	11,223	17,130
Nkange	CDC	3,473	3,927	4,427	4,970	5,520	6,772
Sefhare	CDC	3,260	3,743	4,229	4,796	5,340	6,551
Lerala	CDC	2,897	3,904	5,089	6,486	8,061	12,320
Maunatlala	CDC	2,649	3,235	3,869	4,629	5,418	7,337
Kalamare	CDC	2,640	3,272	3,964	4,794	5,668	7,828
Tsienyane (Rakops)	CDC	2,178	2,288	2,410	2,576	2,729	3,044
Ramokgonami	CDC	2,138	2,418	2,725	3,060	3,398	4,169
Gweta	CDC	2,022	2,298	2,591	2,909	3,230	3,963
Other b/	CDC	75,053	85,399	96,783	109,219	121,882	147,264
DISTRICT TOTAL	CDC	229,349	269,908	314,702	365,962	421,096	554,062
Ghanzi	GDC	4,737	5,532	6,388	7,439	8,655	11,699
Other b/	GDC	3,737	4,121	4,603	5,209	5,835	7,274
DISTRICT TOTAL	GDC	8,474	9,653	10,991	12,648	14,490	18,973
Hukuntsi	KGDC	2,172	2,295	2,388	2,440	2,452	2,459
Tsabong	KGDC	1,996	2,166	2,389	2,648	2,902	3,463
Other b/	KGDC	7,228	7,818	8,850	10,194	11,581	14,924
DISTRICT TOTAL	KGDC	11,396	12,279	13,627	15,282	16,935	20,846
Mochudi	KTDC	28,699	35,627	43,127	51,489	60,738	84,107
Bokaa	KTDC	3,266	3,989	4,807	5,601	6,395	8,288
Mmathubudukwane	KTDC	2,697	3,437	4,215	4,921	5,619	7,282
Modipane	KTDC	2,219	2,539	2,855	3,187	3,509	4,228
Oodi	KTDC	2,219	2,539	2,855	3,187	3,509	4,228
Other b/	KTDC	9,240	11,186	13,151	15,361	17,707	23,406
DISTRICT TOTAL	KTDC	48,340	59,317	71,010	83,746	97,477	131,539
Molepolole	KWDC	31,703	38,765	46,530	55,313	65,097	89,791
Thamaga	KWDC	7,625	7,992	8,310	8,620	8,862	9,326
Mmankgodi	KWDC	3,322	3,760	4,277	4,846	5,414	6,712
Gabane	KWDC	3,307	3,422	3,621	3,850	4,052	4,463
Letlhankeng	KWDC	2,735	2,852	3,039	3,264	3,507	4,047
Kopong	KWDC	2,357	2,716	3,141	3,622	4,113	5,265
Other b/	KWDC	16,935	19,263	22,066	25,124	28,268	35,605
DISTRICT TOTAL	KWDC	67,984	78,770	90,984	104,639	119,313	155,209
Nlapkhane	NEDC	3,335	4,302	5,398	6,617	7,882	11,049
Mapoka	NEDC	3,292	4,511	5,224	5,808	6,380	7,655
Tati	NEDC	2,866	3,903	4,826	5,456	5,994	7,191
Tsamaya	NEDC	2,535	3,439	3,975	4,419	4,855	5,825
Masunga	NEDC	1,376	1,553	1,731	1,902	2,071	2,446
Other b/	NEDC	22,592	25,042	27,866	30,982	34,037	40,836
DISTRICT TOTAL	NEDC	35,996	42,750	49,020	55,184	61,219	75,002
Maun	NWDC	24,275	30,408	37,296	45,163	54,011	76,866

Kasane	NWDC	4,069	4,638	5,545	6,630	7,847	10,944
Gomare	NWDC	2,213	2,581	2,928	3,251	3,577	4,309
Other b/	NWDC	9,462	10,637	11,998	13,621	15,311	19,469
DISTRICT TOTAL	NWDC	40,019	48,264	57,767	68,665	80,746	111,588
Kanye	SDC	30,236	36,625	43,749	51,801	60,796	83,444
Moshupa	SDC	8,076	8,700	9,349	10,077	10,790	12,328
Manyana	SDC	3,225	4,051	4,978	6,051	7,211	10,149
Pitsane/Maphiltlhwane	SDC	3,004	4,004	5,226	6,691	8,321	12,712
Mmathethe	SDC	2,973	3,617	4,325	5,139	6,003	8,125
Ranaka	SDC	2,455	2,765	3,086	3,429	3,770	4,534
Digawana	SDC	2,283	2,572	2,870	3,189	3,506	4,216
Other b/	SDC	26,023	30,092	34,550	39,470	44,566	56,728
DISTRICT TOTAL	SDC	78,275	92,426	108,133	125,847	144,963	192,236
Ramotswa	SEDC	20,901	26,193	32,036	38,463	45,494	63,286
Tlokweng	SEDC	12,337	15,951	19,676	23,652	27,881	38,457
Otse	SEDC	5,172	6,902	8,904	10,969	12,955	17,784
Mogobane	SEDC	3,729	5,129	6,788	8,237	9,680	13,288
Other b/	SEDC	1,272	1,590	1,930	2,302	2,705	3,714
DISTRICT TOTAL	SEDC	43,411	55,765	69,334	83,623	98,715	136,529
OVERALL TOTAL		563,244	669,132	785,568	915,596	1,054,954	1,395,984

TABLE E2 SUMMARY OF POPULATION PROJECTIONS

District	1990	1995	2000	2005	2010	2020
Central	229,349	269,908	314,702	365,962	421,096	554,062
Ghanzi	8,474	9,653	10,991	12,648	14,490	18,973
Kgalagadi	11,396	12,279	13,627	15,282	16,935	20,846
Kgatleng	48,340	59,317	71,010	83,746	97,477	131,539
Kweneng	67,984	78,770	90,984	104,639	119,313	155 209
North East	35,996	42,750	49,020	55,184	61,219	75,002
North West	40,019	48,264	57,767	68,665	80,746	111,588
Southern	78,275	92,426	108,133	125,847	144,963	192,236
South East	43,411	55,765	69,334	83,623	98,715	136,529
OVERALL TOTAL	563,244	669,132	785,568	915,596	1,054,954	1,395,984

TABLE E3 MLGL ESTIMATES OF POPULATION AND OCCUPIED HOUSEHOLDS IN SETTLEMENTS COVERED BY THE NRSP

Settlement	District Council	Persons	Occupied Households	People per Occupied Household
Serowe	CDC	23,661	3,669	6.4
Mahalapye	CDC	20,712	3,247	6.4
Palapye	CDC	9,593	1,614	5.9
Tonota-Shashe	CDC	7,872	1,160	6.8
Bobonong	CDC	4,711	930	5.1
Shoshong	CDC	4,600	733	6.3
Tutume	CDC	3,736	604	6.2
Sefhare	CDC	2,443	380	6.4
Rakops	CDC	1,938	311	6.2
Tsetsebjwe	CDC	1,570	233	6.7
Mopipi	CDC	1,540	247	6.2
Nata	CDC	1,303	210	6.2
Thabala	CDC	1,242	178	7.0
Mathangwane	CDC	1,106	190	5.8
Kgagodi	CDC	933	169	5.5
Borolong	CDC	845	144	5.9
Chadibe	CDC	539	81	6.7

DISTRICT OVERALL	CDC	88,344	14,100	6 3
Ghanzi	GDC	3,281	656	5 0
DISTRICT OVERALL	GDC	3,281	656	5 0
Mochudi	KTDC	18,386	3,453	5.3
Bokaa	KTDC	2,018	292	6.9
Mathubudukwane	KTDC	1,754	332	5.3
Oodi	KTDC	1,599	283	5 7
Maloiwane	KTDC	1,360	239	5 7
Morwa	KTDC	1,337	264	5 1
Modipane	KTDC	1,220	195	6.3
Sikwane	KTDC	1,090	199	5 5
Rasesa	KTDC	879	152	5 8
Mabalane	KTDC	681	117	5.8
Matebele	KTDC	386	77	5.0
Ramonaka	KTDC	275	54	5 1
Lesnibitse	KTDC	268	40	6.7
Dikwididi	KTDC	228	29	7.9
Pilane	KTDC	193	49	3.9
Molotwana	KTDC	175	36	4.9
DISTRICT OVERALL	KTDC	31,849	5,811	5.5
Molepolole	KWDC	20,565	3,676	5.6
Thamaga	KWDC	6,520	1,150	5 7
Mmankgodi	KWDC	2,693	411	6 6
Gabane	KWDC	2,688	451	6.0
Letlhakeng	KWDC	2,616	388	6 7
Kopong	KWDC	1,846	262	7 0
Lentsweletau	KWDC	1,395	236	5 9
Kumakwane	KWDC	1,350	234	5.8
Ditshegwane	KWDC	821	144	5.7
DISTRICT OVERALL	KWDC	40,494	6,952	5.8
Tati Siding	NEDC	1,390	246	5.7
Tsamaya	NEDC	1,202	204	5 9
Masunga	NEDC	1,195	204	5 9
Matshelegabedi c/	NEDC	488	84	5 8
DISTRICT OVERALL	NEDC	4,275	738	5.8
Seronga	NWDC	576	122	4 7
Matlapaneng	NWDC	530	110	4 8
DISTRICT OVERALL	NWDC	1,106	232	4 8
Kanye	SDC	20,215	3,625	5.6
Moshopa	SDC	6,612	1,177	5.6
Mmathethe	SDC	1,990	353	5.6
Pitsane	SDC	1,649	266	6.2
Phitshane-Molopo	SDC	1,036	213	4 9
Goodhope	SDC	841	143	5.9
Gathwane	SDC	711	121	5.9
Kgoro	SDC	658	106	6.2
Tlhareselele	SDC	634	117	5.4
Hebron	SDC	576	36	16.0
Mokgomane	SDC	359	52	6.9
Magoripitse	SDC	348	73	4.8
Metlojane	SDC	335	45	7.4
Malokaganyane	SDC	315	37	8.5
Bethel	SDC	295	49	6 0
Dinatshana	SDC	273	46	5.9
DISTRICT OVERALL	SDC	36,847	6,459	5.7
Ramotswa	SEDC	13,009	2,085	6.2
Tlokweng	SEDC	6,653	1,111	6.0
Otse	SEDC	2,240	415	5.4
Mogobane	SEDC	1,506	232	6.5
Taung	SEDC	800	139	5.8
DISTRICT OVERALL	SEDC	24,208	3,982	6.1
OVERALL TOTAL		230,404	38,930	5.9

TABLE E4 ESTIMATION OF TOTAL NUMBERS OF OCCUPIED HOUSEHOLDS

	MLGL 1990 Estimates		MLGL Estimates as Percentage of NWMP Population Projections		Estimated Population in 1990 Using MLGL and NWMP Population Data	
District	Persons	Households	Persons	Households	Persons	Households
Central	88,344	14,100	39%	39%	229,349	36,605
Ghanzi	3,281	656	39%	39%	8,474	1,694
Kgalagadi d/	N/A	N/A	N/A	N/A	11,396	1,926
Kgatleng	31,849	5,811	66%	66%	48,340	8,820
Kweneng	40,494	6,952	60%	60%	67,984	11,671
North East	4,275	738	12%	12%	35,996	6,216
North West	1,106	232	3%	3%	40,019	8,395
Southern	36,847	6,459	47%	47%	78,275	13,721
South East	24,208	3,982	56%	56%	43,411	7,141
OVERALL TOTAL	230,404	38,930	41%	41%	563,244	96,189

TABLE E5 PROJECTIONS OF NUMBERS OF HOUSEHOLDS, 1990 - 2020 e/

District	1990	1995	2000	2005	2010	2020
Central	36,605	43,078	50,227	58,409	67,208	88,430
Ghanzi	1,694	1,930	2,198	2,529	2,897	3,793
Kgalagadi	1,926	2,075	2,302	2,582	2,861	3,522
Kgatleng	8,820	10,823	12,956	15,280	17,785	24,000
Kweneng	11,671	13,523	15,620	17,964	20,484	26,646
North East	6,216	7,383	8,466	9,530	10,572	12,953
North West	8,395	10,124	12,117	14,404	16,938	23,407
Southern	13,721	16,202	18,955	22,060	25,411	33,698
South East	7,141	9,173	11,405	13,755	16,238	22,458
OVERALL TOTAL	96,189	114,310	134,247	156,513	180,394	238,907

TABLE E6 ESTIMATES OF HOUSEHOLDS WITHOUT TOILET FACILITIES

District	Estimates from 1981 Census	Indications from Study Field Visits	Adopted Estimate for 1990
Central	76.4%	75.0%	75.0%
Ghanzi	85 2%	90 0%	90.0%
Kgalagadi	61.0%	80 0%	75.0%
Kgatleng	72.2%	75.0%	75 0%
Kweneng	86.5%	80 0%	85.0%
North East	86.2%	75 0%	80.0%
North West	87.4%	85 0%	85 0%
Southern	30 2%	60 0%	50.0%
South East	17 4%	60 0%	50.0%

TABLE E7 PROJECTIONS OF HOUSEHOLDS WITHOUT ANY FORM OF TOILET FACILITY, 1990-2020 f/

District	1990	1995	2000	2005	2010	2020
Central	27,454	32,309	37,671	43,807	50,406	66,323
Ghanzi	1,525	1,737	1,978	2,276	2,607	3,414
Kgalagadi	1,444	1,556	1,727	1,937	2,146	2,642
Kgatleng	6,615	8,117	9,717	11,460	13,339	18,000
Kweneng	9,921	11,495	13,277	15,270	17,411	22,649
North East	4,973	5,906	6,772	7,624	8,458	10,362
North West	7,135	8,605	10,300	12,243	14,397	19,896
Southern	6,861	8,101	9,477	11,030	12,705	16,849
South East	3,570	4,586	5,702	6,878	8,119	11,229
OVERALL TOTAL	69,498	82,412	96,622	112,523	129,589	171,364

TABLE E8 NRSP ANNUAL LATRINE CONSTRUCTION PROGRAMME TO ACHIEVE TARGET LEVEL OF COVERAGE FROM 2010 ONWARDS g/

TARGET = 60%

District	1990 to 1994	1995 to 1999	2000 to 2004	2005 to 2009	2010 to 2019	All Years Total for 1990-2018
Central	850	1,733	1,733	1,733	955	39,794
Ghanzi	100	71	71	71	48	2,048
Kgalagadi	120	46	46	46	30	1,585
Kgatleng	453	383	383	383	280	10,800
Kweneng	790	433	433	433	314	13,590
North East	300	238	238	238	114	6,217
North West	200	509	509	509	330	11,938
Southern	350	392	392	392	249	10,109
South East	300	225	225	225	187	6,737
Annual Totals	3,463	4,029	4,029	4,029	2,506	N/A
Totals All Years	17,315	20,146	20,146	20,146	25,065	102,818

TABLE E9 HOUSEHOLDS WITH LATRINES ASSUMING NRSP ACHIEVES TARGET LEVEL OF COVERAGE FROM 2010 ONWARDS g/

TARGET = 60%

District	1990	1995	2000	2005	2010	2020
Central	25%	35%	51%	62%	70%	70%
Ghanzi	10%	36%	49%	58%	64%	64%
Kgalagadi	25%	54%	61%	66%	70%	70%
Kgatleng	25%	46%	57%	65%	70%	70%
Kweneng	15%	44%	54%	61%	66%	66%
North East	20%	40%	52%	61%	68%	68%
North West	15%	25%	44%	57%	66%	66%
Southern	50%	61%	70%	76%	80%	80%
South East	50%	66%	73%	77%	80%	80%
All Districts	28%	43%	56%	65%	71%	71%

STRATEGY OPTION 1

TABLE E10 ESTIMATED NRSP UNIT PROVISION COSTS. COUNCIL METHOD h/ i/

(Pula, 1990 Prices)

	CDC	GDC j/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Annual Number of Latrines	250	100	0	253	650	0	0	150	0	156
Project Overheads										
Supervision (R)	124.53	180.68	0.00	77.68	67.51	0.00	0.00	206.91	0.00	102.47
Health Education.										
Capital (D)	20.00	38.00	0.00	17.85	11.85	0.00	0.00	37.14	0.00	18.95
Council Staff (R)	0.00	0.00	0.00	0.00	10.49	0.00	0.00	0.00	0.00	4.86
Total	20.00	38.00	0.00	17.85	22.34	0.00	0.00	37.14	0.00	23.81
Vehicles										
Capital Charges (D)	200.49	224.23	0.00	172.04	86.96	0.00	0.00	281.39	0.00	143.84
Labour (R)	61.32	76.65	0.00	50.49	19.65	0.00	0.00	85.17	0.00	43.71
Other Recurrent (R)	143.31	153.73	0.00	124.70	48.54	0.00	0.00	206.98	0.00	103.60
Total	405.12	454.61	0.00	347.24	135.16	0.00	0.00	573.53	0.00	291.14
Sub-Total	549.65	673.29	0.00	442.77	225.01	0.00	0.00	817.58	0.00	417.43
Excavation										
Household Labour (H)	27.50	16.00	0.00	18.75	18.75	0.00	0.00	30.00	0.00	21.32
Compressor										
Capital Charges (D)	79.70	141.69	0.00	132.83	132.83	0.00	0.00	94.46	0.00	119.89
Labour (R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Recurrent (R)	46.73	83.07	0.00	77.88	77.88	0.00	0.00	55.38	0.00	70.29
Total	126.43	224.76	0.00	210.71	210.71	0.00	0.00	149.84	0.00	190.19
Sub-Total	153.93	240.76	0.00	229.46	229.46	0.00	0.00	179.84	0.00	211.50
Substructure										
Materials (D)	138.60	574.00	0.00	201.33	133.57	0.00	0.00	168.00	0.00	181.76
Labour (R)	488.00	442.56	0.00	735.37	283.68	0.00	0.00	308.31	0.00	415.50
Tools (D)	54.50	19.40	0.00	20.31	14.55	0.00	0.00	33.33	0.00	25.06
Sub-Total	681.10	1,035.96	0.00	957.01	431.80	0.00	0.00	509.64	0.00	622.32
Fittings										
Materials (D)	63.73	63.73	0.00	73.67	66.93	0.00	0.00	105.00	0.00	71.42
Labour (R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	63.73	63.73	0.00	73.67	66.93	0.00	0.00	105.00	0.00	71.42
Superstructure										
Materials (H)	237.30	615.80	0.00	213.66	319.27	0.00	0.00	213.66	0.00	295.46
Materials (R)	0.00	0.00	0.00	25.00	28.50	0.00	0.00	25.00	0.00	20.38
Labour (H)	100.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00
Sub-Total	337.30	715.80	0.00	338.66	447.77	0.00	0.00	338.66	0.00	415.85
OVERALL TOTAL	1,785.71	2,729.54	0.00	2,041.57	1,400.97	0.00	0.00	1,950.72	0.00	1,738.51

STRATEGY OPTION 1

TABLE E11 ESTIMATED NRSP UNIT PROVISION COSTS: CONTRACTOR METHOD h/ I/

(Pula, 1990 Prices)

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Annual Number of Latrines	600	100	120	200	140	300	200	200	300	240
Project Overheads										
Supervision (R)	53 66	139 48	188 29	32 86	70 33	97 69	137 64	42 46	75 68	80 18
Health Education										
Capital (D)	20.00	38 00	58 33	17.85	11 85	30 17	101 28	37 14	26 46	33 66
Council Staff (R)	0.00	0 00	0 00	0 00	10.49	36 76	26 94	0 00	0 00	8 28
Total	20 00	38 00	58 33	17 85	22 34	66 93	128.22	37 14	26 46	41 94
Vehicles										
Capital Charges (D)	52 76	224 23	197 85	32 98	47 11	35 17	145 09	26.38	35 17	67 78
Labour (R)	25.55	76 65	63 88	12 78	18.25	17.03	51.10	12 78	17 03	27 21
Other Recurrent (R)	37 75	153 73	145.09	21 39	30 56	36.99	102 97	18 88	25 16	49 54
Total	116 06	454 61	406 82	67.14	95.91	89 20	299 16	58.03	77 37	144 53
Sub-Total	189 72	632.09	653.44	117.85	188.58	253.82	565 02	137.63	179 51	266.64
Excavation										
Household Labour (H)	27.50	16.00	16 00	18 75	18.75	80.00	37 50	30 00	25 00	33 05
Compressor										
Capital Charges (D)	79 71	141.70	106 27	132 84	132.84	35 42	44.28	94 46	177 12	97 88
Labour (R)	47 25	84 00	63 00	78 75	78 75	21.00	26.25	56 00	105 00	58.03
Other Recurrent (R)	46 72	83 06	62 30	77 87	77 87	20 77	25 96	55.38	103 83	57 38
Total	173 68	308 76	231 57	289 46	289 46	77.19	96 49	205.84	385 95	213.29
Tools (D)	0.00	0 00	0 00	0 00	0.00	20.33	0 00	0 00	0 00	2 82
Sub-Total	201 18	324 76	247.57	308.21	308.21	177.52	133.99	235 84	410.95	249 16
Substructure										
Contractor (D)	470 00	120.00	200.00	530 00	650 00	600.00	350 00	550.00	550.00	481 48
Other Materials (D)	0 00	574 00	524 40	0.00	0 00	0 00	471 00	0 00	0 00	99 32
Tools (D)	0.00	19 40	36 67	0.00	0.00	0.00	86.95	0 00	0.00	10 99
Council Labour (R)	0 00	0 00	0 00	0 00	0 00	0.00	48 00	0 00	0 00	4 44
Sub-Total	470 00	713 40	761 07	530.00	650 00	600 00	955 95	550 00	550.00	596.23
Fittings										
Materials (D)	63 73	63 73	63.73	73 67	66.93	67.53	79 24	105 00	67 53	71 17
Labour (R)	0.00	14.73	17.50	14.73	14.73	14 73	0.00	10 98	14 73	9 08
Sub-Total	63 73	78.46	81.23	88 40	81.66	82.26	79 24	115.98	82 26	80.25
Superstructure										
Materials (H)	237 30	615 80	569 00	213 66	319.27	209.30	579 00	213 66	238 66	302.12
Materials (R)	0 00	0.00	0 00	25.00	28.50	28.00	0 00	25 00	0 00	10 37
Labour (H)	100 00	100.00	140.00	100 00	100.00	100.00	100 00	100 00	150 00	109 17
Sub-Total	337 30	715.80	709.00	338.66	447.77	337.30	679.00	338 66	388.66	421 66
OVERALL TOTAL	1,261 93	2,464 51	2,452 31	1,383 12	1,676.22	1,450.90	2,413 20	1,378 11	1,611 38	1,613 95

TABLE E12 STRATEGY OPTION 1
SUMMARY OF NRSP UNIT PROVISION COSTS h/
(Pula, 1990 Prices)

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Project Overheads	549 65	673 29	0 00	442 77	225 01	0 00	0.00	817 58	0.00	417 43
Excavation	153.93	240.76	0.00	229 46	229.46	0.00	0.00	179 84	0 00	211 50
Substructure	681 10	1,035 96	0 00	957.01	431 80	0.00	0.00	509 64	0 00	622 32
Fittings	63 73	63.73	0.00	73.67	66 93	0.00	0.00	105 00	0 00	71 42
Superstructure	337 30	715.80	0.00	338.66	447.77	0.00	0.00	338 66	0.00	415 85
OVERALL TOTAL	1,785 71	2,729 54	0.00	2,041.57	1,400.97	0.00	0.00	1,950 72	0.00	1,738 51
Contractor Delivery Method										
Project Overheads	189 72	632 09	653 44	117.85	188.58	253.82	565 02	137 63	179 51	266 64
Excavation	201 18	324 76	247 57	308 21	308 21	177.52	133 99	235 84	410 95	249 16
Substructure	470 00	713 40	761.07	530 00	650.00	600.00	955.95	550 00	550 00	596 23
Fittings	63 73	78.46	81 23	88 40	81.66	82.26	79 24	115 98	82 26	80 25
Superstructure	337 30	715 80	709 00	338 66	447 77	337 30	679.00	338 66	388 66	421 66
OVERALL TOTAL	1,261.93	2,464 51	2,452 31	1,383 12	1,676.22	1,450 90	2,413.20	1,378 11	1,611 38	1,613 95

TABLE E13 STRATEGY OPTION 1
SUMMARY OF PERCENTAGE NRSP UNIT PROVISION COSTS h/

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Project Overheads	30 8%	24 7%	0.0%	21 7%	16.1%	0 0%	0.0%	41 9%	0 0%	23 1%
Excavation	8.6%	8.8%	0.0%	11.2%	16 4%	0.0%	0.0%	9.2%	0 0%	12 8%
Substructure	38.1%	38.0%	0 0%	46 9%	30 8%	0 0%	0 0%	26 1%	0 0%	35 0%
Fittings	3 6%	2 3%	0 0%	3 6%	4 8%	0.0%	0 0%	5 4%	0 0%	4 2%
Superstructure	18.9%	26 2%	0 0%	16.6%	32 0%	0.0%	0 0%	17 4%	0 0%	24 9%
OVERALL TOTAL	100 0%	100 0%	0.0%	100 0%	100.0%	0.0%	0.0%	100 0%	0 0%	100 0%
Contractor Delivery Method										
Project Overheads	15.0%	25.6%	26 6%	8.5%	11.3%	17.5%	23.4%	10 0%	11 1%	15 4%
Excavation	15 9%	13.2%	10 1%	22 3%	18 4%	12.2%	5.6%	17 1%	25 5%	16 2%
Substructure	37.2%	28.9%	31.0%	38.3%	38.8%	41.4%	39.6%	39.9%	34 1%	37 3%
Fittings	5 1%	3 2%	3.3%	6.4%	4.9%	5.7%	3.3%	8.4%	5 1%	5 2%
Superstructure	26 7%	29.0%	28.9%	24.5%	26 7%	23.2%	28.1%	24.6%	24 1%	25 8%
OVERALL TOTAL	100.0%	100 0%	100.0%	100.0%	100.0%	100 0%	100.0%	100.0%	100.0%	100 0%

TABLE E14 STRATEGY OPTION 1
ANALYSIS OF NRSP UNIT PROVISION COSTS BY TYPE h/
(Pula, 1990 Prices)

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Supervision & Administration	124 53	180.68	0.00	77.68	78.00	0.00	0 00	206.91	0.00	107 33
Labour	676 82	635 21	0.00	904.61	422 08	0.00	0 00	523 48	0 00	580 52
Materials & Equipment	984.36	1,913 65	0 00	1,059.28	900.88	0 00	0.00	1,220 34	0 00	1,050 66
OVERALL TOTAL	1,785 71	2,729.54	0.00	2,041.57	1,400.97	0.00	0.00	1,950 72	0 00	1,738 51
Contractor Delivery Method										
Supervision & Administration	53 66	139.48	188.29	32.86	80.82	134.45	164.58	42.46	75.68	88.46
Contract Costs	470 00	120 00	200 00	530 00	650.00	600 00	350.00	550.00	550 00	481 48
Other Labour	200.30	291.38	300 38	225 00	230 48	232 76	262.85	209 76	311.76	240 98
Other Materials & Equipment	537.96	1,913.65	1,763 64	595.25	714.92	483.69	1,635.77	575.89	673 93	803 03
OVERALL TOTAL	1,261.92	2,464.51	2,452 31	1,383 12	1,676.22	1,450.90	2,413.20	1,378.11	1,611.38	1,613 95

STRATEGY OPTION 1

TABLE E15 ANALYSIS OF PERCENTAGE NRSP UNIT PROVISION COSTS BY TYPE h/

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Council Delivery Method										
Supervision & Administration	7 0%	6 6%	0.0%	3.8%	5.6%	0 0%	0.0%	10.6%	0 0%	6 1%
Labour	37 9%	23 3%	0.0%	44.3%	30 1%	0.0%	0.0%	26.8%	0.0%	33 2%
Materials & Equipment	55 1%	70 1%	0.0%	51 9%	64.3%	0.0%	0.0%	62.6%	0 0%	60 7%
OVERALL TOTAL	100 0%	100 0%	0 0%	100 0%	100.0%	0 0%	0.0%	100.0%	0 0%	100.0%
Contractor Delivery Method										
Supervision & Administration	4 3%	5 7%	7.7%	2.4%	4.8%	9.3%	6 8%	3.1%	4 7%	5 3%
Contract Costs	37 2%	4 9%	8 2%	38 3%	38 8%	41 4%	14.5%	39.9%	34 1%	32.6%
Other Labour	15 9%	11 8%	12 2%	16 3%	13 7%	16 0%	10.9%	15.2%	19 3%	15 4%
Other Materials & Equipment	42 6%	77 6%	71 9%	43 0%	42 7%	33 3%	67 8%	41.8%	41 8%	46.8%
OVERALL TOTAL	100 0%	100 0%	100 0%	100 0%	100.0%	100 0%	100.0%	100.0%	100.0%	100 0%

STRATEGY OPTION 1

TABLE E16 ANALYSIS OF UNIT NRSP PROVISION COSTS BY BUDGET CATEGORY h/
(Pula, 1990 Prices)

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Council Delivery Method										
Development Expenditures										
Capital Budget	557.02	1,061 05	0.00	618 04	426 70	0.00	0 00	719 32	0 00	560 92
Recurrent Budget k/	833 89	906 69	0.00	1,061 13	506 25	0 00	0.00	857.75	0 00	730 81
Householder k/										
Labour/Materials	364 80	731 80	0 00	332 41	438.02	0.00	0.00	343 66	0.00	416 78
Registration Fee	30 00	30 00	0 00	30 00	30.00	0.00	0.00	30 00	0.00	30 00
Reduced Subsidies	0 00	0.00	0 00	0.00	0.00	0 00	0.00	0.00	0 00	0.00
Total	394 80	761 80	0 00	362 41	468.02	0 00	0.00	373 66	0.00	446 78
Sub-Total	1,785 71	2,729.54	0 00	2,041.57	1,400.97	0.00	0.00	1,950.72	0.00	1,738.51
Contractor Delivery Method										
Development Expenditures										
Capital Budget	686 20	1,181 06	1,187.25	787 33	908.73	788 63	1,277 84	812.98	856 28	865 10
Recurrent Budget k/	180 93	521.65	510.05	233 37	299.48	242.97	388.86	191.47	311 43	274 50
Householder k/										
Labour/Materials	364 80	731 80	725 00	332 41	438.02	389.30	716.50	343.66	413.66	444 34
Registration Fee	30.00	30 00	30.00	30.00	30.00	30.00	30 00	30.00	30.00	30 00
Reduced Subsidies	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	394.80	761 80	755.00	362.41	468.02	419 30	746 50	373.66	443.66	474 34
Sub-Total	1,261.92	2,464.51	2,452.31	1,383.12	1,676.22	1,450.90	2,413.20	1,378.11	1,611.38	1,613 95

STRATEGY OPTION 1

TABLE E17 ANALYSIS OF PERCENTAGE NRSP PROVISION COSTS BY BUDGET CATEGORY h/

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Development Expenditures a/										
Capital Budget	31 2%	38.9%	0.0%	30 3%	30.5%	0.0%	0.0%	36.9%	0.0%	31 8%
Council Recurrent b/	46.7%	33 2%	0.0%	52.0%	36.1%	0.0%	0.0%	44.0%	0.0%	41 5%
Householder b/										
Labour/Materials	20 4%	26 8%	0 0%	16 3%	31.3%	0 0%	0.0%	17.6%	0 0%	24 9%
Registration Fee	1 7%	1.1%	0.0%	1.5%	2.1%	0.0%	0.0%	1.5%	0.0%	1.8%
Reduced Subsidies	0 0%	0 0%	0 0%	0 0%	0.0%	0 0%	0.0%	0.0%	0 0%	0 0%
Sub-Total	22 1%	27 9%	0.0%	17.8%	33 4%	0 0%	0 0%	19 2%	0 0%	26 7%
Total	100.0%	100 0%	0 0%	100.0%	100 0%	0.0%	0 0%	100.0%	0 0%	100 0%
Contractor Delivery Method										
Development Expenditures a/										
Capital Budget	54 4%	47 9%	48 4%	56.9%	54 2%	54 4%	53 0%	59.0%	53 1%	54 1%
Council Recurrent b/	14 3%	21 2%	20.8%	16 9%	17 9%	16 7%	16.1%	13.9%	19 3%	16 6%
Householder. b/										
Labour/Materials	28 9%	29 7%	29 6%	24 0%	26 1%	26 8%	29.7%	24 9%	25 7%	27 3%
Registration Fee	2.4%	1 2%	1.2%	2 2%	1.8%	2.1%	1.2%	2.2%	1 9%	2 0%
Reduced Subsidies	0.0%	0 0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 0%
Sub-Total	31.3%	30.9%	30 8%	26.2%	27.9%	28 9%	30 9%	27.1%	27 5%	29 3%
Total	100.0%	100 0%	100.0%	100 0%	100 0%	100 0%	100 0%	100.0%	100 0%	100 0%

STRATEGY OPTION 1

TABLE E18 OUTLINE ESTIMATES OF UNIT DESLUDGING COSTS USING VACCUUM TANKERS h/
(Pula, 1990 Prices)

All Delivery Methods	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC
Area (sq km'000s)	143	118	110	7 6	38	5	130	27	1
Annual Kms Per Tanker	35,000	35,000	35,000	30,000	30,000	30,000	35,000	30,000	25,000
Annual Operating Days	175	175	175	175	175	175	175	175	175
Daily Kms Per Tanker	200	200	200	171	171	171	200	171	143
Daily Fuel Cost (P)	39 50	39.50	39.50	33 86	33.86	33.86	39.50	33 86	28 21
Daily Fixed Costs (P)	259 23	259 23	259.23	259.23	259.23	259.23	259.23	259.23	259.23
Total Daily Costs (P)	298.73	298.73	298 73	293.09	293 09	293.09	298.73	293.09	287 44
Latrines per Day	1.50	1.50	1.50	2 50	2 00	2.00	1.50	2 00	3 00
Cost Per Desludging (P)	199 15	199 15	199 15	117.23	146.54	146 54	199.15	146 54	95 81
Latrine Capacity (Years)	8	8	8	8	8	8	8	8	8
Av. Annual Cost Per Latrine (P)	24 89	24.89	24.89	14.65	18.32	18.32	24.89	18.32	11 98
Council Recurrent Costs (P)	23.65	23 65	23 65	13.92	17.40	17.40	23.65	17.40	11.38
Householder Contribution (P)	1.24	1.24	1.24	0.73	0.92	0.92	1.24	0.92	0.60

Av Diesel Price (P) 0.79
Av. Litres/km = 0.25

STRATEGY OPTION 1 ASSUMPTIONS FOR NRSP ANNUAL COST PROJECTIONS

1) Level of Coverage = 60%
2) GoB Subsidy for Usage of Compressor = 100%
3) GoB Subsidy for Desludging of Latrines = 95%
4) GoB Subsidy for Substructure & Fittings = 100%
5) Rate of Inflation = 10%
6) Inflation Linking of Registration Fees FALSE
7) Contingencies = 10%
8) Average Latrine Capacity (8, 12 or 16 Years) = 8

9) Annual Latrine Provision

	1990-94	1995-99	2000-04	2005-10	2010-19	All Years 1990-2019
Central District	850	1,733	1,733	1,733	955	39,794
Ghanzi District	100	71	71	71	48	2,048
Kgalagadi District	120	46	46	46	30	1,585
Kgatleng District	453	383	383	383	280	10,800
Kweneng District	790	433	433	433	314	13,590
North East District	300	238	238	238	114	6,217
North West District	200	509	509	509	330	11,938
Southern District	350	392	392	392	249	10,109
South East District	300	225	225	225	187	6,737
Annual Totals	3,463	4,029	4,029	4,029	2,506	102,818

10) Use of Council & Contractor Delivery Methods

	CDC	GDC j/ l/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC
Existing									
Council Method	29%	N/A	0%	56%	82%	0%	0%	43%	0%
Contractor Method	71%	N/A	100%	44%	18%	100%	100%	57%	100%
Assumed m/									
Council Method	29%	25%	0%	56%	82%	0%	0%	43%	0%
Contractor Method	71%	75%	100%	44%	18%	100%	100%	57%	100%

11) Rough Additional Costs of Implementing Strategy (Pula'000s)

Workshops etc	150
Latrine Technology R&D	0
H/Education Development	0
Sub-total	150

TABLE E19 SUMMARY OF COST PROJECTIONS, INCLUSIVE OF CONTINGENCIES h/
(Total Costs for All Years in Pula'000s, 1990 Constant Prices)

STRATEGY OPTION 1

	1990-94	1995-99	2000-04	2005-10	2010-19	All Years 1990-2019
Programme Costs						
Central District	6,620	13,496	13,496	13,496	14,875	61,981
Ghanzi District	1,392	988	988	988	1,347	5,703
Kgalagadi District	1,619	618	618	618	802	4,276
Kgatleng District	4,362	3,684	3,684	3,684	5,386	20,800
Kweneng District	6,299	3,453	3,453	3,453	5,012	21,672
North East District	2,394	1,902	1,902	1,902	1,823	9,923
North West District	2,655	6,759	6,759	6,759	8,759	31,689
Southern District	3,125	3,496	3,496	3,496	4,440	18,054
South East District	2,659	1,992	1,992	1,992	3,308	11,942
Sub-total	31,124	36,388	36,388	36,388	45,752	186,039
Costs of Implementing Strategy	150	0	0	0	0	150
TOTAL	31,274	36,388	36,388	36,388	45,752	186,189
Funding of Programme Costs						
Capital Budgets	14,156	16,940	16,940	16,940	21,212	86,186
Council Recurrent Budgets	8,558	9,654	9,782	9,861	12,588	50,442
Householder Contributions	8,560	9,795	9,666	9,587	11,952	49,560
TOTAL	31,274	36,388	36,388	36,388	45,752	186,189
Latrine Desludging Costs						
Council Recurrent Cost	0	1,711	3,310	6,467	17,819	29,308
Householder Contribution	0	90	174	340	938	1,543
TOTAL	0	1,801	3,484	6,808	18,757	30,850
OVERALL COSTS	31,274	38,189	39,872	43,195	64,509	217,039

TABLE E20 NRSP ANNUAL COST PROJECTIONS IN 1990 CONSTANT PRICES h/ (INCLUSIVE OF CONTINGENCIES)

STRATEGY OPTION 1

(Annual Costs in Pula'000s, 1990 Constant Prices)

	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Average Price Index, 1990 = 1.00	1.22	1 97	3 17	5.10	10.72	4.44
Central District						
Capital Budgets	606 1	1,235.6	1,235.6	1,235.6	680.9	28,373.7
Council Recurrent Budgets	353 8	739 1	750 1	756 9	420 4	17,203.4
Householder Contributions	364 1	724.5	713.4	706 6	386 2	16,404.4
Annual Totals	1,323.9	2,699.1	2,699 1	2,699 1	1,487 5	61,981.5
All Years Totals	6,619.7	13,495.7	13,495 7	13,495.7	14,874.6	61,981.5
Ghanzi District						
Capital Budgets	126 6	89.9	89.9	89 9	61.3	2,593.7
Council Recurrent Budgets	68.6	49 4	49 8	50 1	34.3	1,433.0
Householder Contributions	83.2	58 3	57 9	57 6	39 1	1,675.9
Annual Totals	278.4	197.5	197 5	197 5	134.7	5,702 6
All Years Totals	1,391.9	987.7	987 7	987.7	1,347.4	5,702.6
Kgalagadi District						
Capital Budgets	156 7	59.9	59 9	59.9	38.8	2,070 0
Council Recurrent Budgets	68 0	26.5	26 8	26 9	17 6	916 7
Householder Contributions	98.9	37.3	37 0	36.9	23 8	1,288 9
Annual Totals	323 7	123.7	123 7	123.7	80.2	4,275.6
All Years Totals	1,618 5	618.3	618.3	618.3	802.2	4,275 6
Kgatleng District						
Capital Budgets	345.2	291 5	291 5	291 5	213 1	8,230.2
Council Recurrent Budgets	349 4	299 0	301 4	302.9	222.4	8,486 7
Householder Contributions	177.9	146.3	143 9	142 4	103.1	4,083 2
Annual Totals	872.5	736.8	736.8	736 8	538 6	20,800 2
All Years Totals	4,362.3	3,683.9	3,683 9	3,683 9	5,386 2	20,800.2
Kweneng District						
Capital Budgets	445 0	244 0	244 0	244 0	177 1	7,655.4
Council Recurrent Budgets	412 8	230 8	233 5	235.2	171.8	7,279.1
Householder Contributions	402 0	216 0	213 2	211 5	152.4	6,737.1
Annual Totals	1,259 8	690.7	690 7	690 7	501 2	21,671 6
All Years Totals	6,299.1	3,453 4	3,453 4	3,453.4	5,012 1	21,671.6
North East District						
Capital Budgets	260.2	206.7	206.7	206 7	99.1	5,393.4
Council Recurrent Budgets	82.0	67.6	69 1	70 0	34 0	1,782.7
Householder Contributions	136 6	106 1	104.5	103 6	49.3	2,746 6
Annual Totals	478.8	380 3	380.3	380 3	182 3	9,922.6
All Years Totals	2,394 0	1,901.7	1,901 7	1,901.7	1,823.5	9,922.6
North West District						
Capital Budgets	281.1	715.8	715.8	715 8	463.8	16,779.9
Council Recurrent Budgets	86.7	226.1	229.3	231.3	151.0	5,377.3
Householder Contributions	163 0	409.9	406.6	404.6	261.1	9,531.6
Annual Totals	530.9	1,351.7	1,351.7	1,351.7	875.9	31,688.8
All Years Totals	2,654.5	6,758.6	6,758.6	6,758.6	8,758.5	31,688.8
Southern District						
Capital Budgets	297.5	332.9	332.9	332 9	211.3	8,594 1
Council Recurrent Budgets	185.7	211.8	214.3	215.8	137.9	5,517.2
Householder Contributions	141.8	154.6	152 1	150.6	94.7	3,942.4
Annual Totals	625.1	699.3	699.3	699.3	444.0	18,053.8
All Years Totals	3,125.3	3,496.3	3,496.3	3,496 3	4,439.6	18,053 8
South East District						
Capital Budgets	282 6	211.7	211.7	211.7	175.8	6,346 0
Council Recurrent Budgets	104 6	80.6	82.1	83 0	69.5	2,446 3
Householder Contributions	144.6	106.0	104 6	103.7	85 5	3,149 8
Annual Totals	531.8	398 4	398 4	398 4	330 8	11,942 0
All Years Totals	2,658 8	1,991.9	1,991.9	1,991.9	3,307 5	11,942.0
Costs of Implementing the Strategy	30.0	0	0	0	0	150 0
ALL DISTRICTS						
Capital Budgets	2,831.1	3,387.9	3,387.9	3,387.9	2,121.2	86,186.4
Council Recurrent Budgets	1,711 6	1,930 7	1,956.3	1,972.3	1,258.8	50,442 4
Householder Contributions	1,712 1	1,958.9	1,933.3	1,917.4	1,195.2	49,559 9
OVERALL ANNUAL TOTALS	6,254.8	7,277.5	7,277.5	7,277.5	4,575.2	186,188.8
OVERALL ALL YEARS TOTALS	31,274 1	36,387.7	36,387.7	36,387.7	45,751.6	186,188 8

TABLE E21 NRSP ANNUAL COST PROJECTIONS IN CURRENT PRICES h/ (INCLUSIVE OF CONTINGENCIES)

STRATEGY OPTION 1

(Annual Costs in Pula'000s, Current Prices)

	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Average Price Index, 1990 = 1.00	1.22	1.97	3 17	5 10	10.72	4.44
Central District						
Capital Budgets	740 0	2,429.8	3,913.2	6,302.2	7,300.8	139,934.1
Council Recurrent Budgets	432 0	1,453 4	2,375 6	3,860 8	4,507.3	85,681.2
Householder Contributions	444.5	1,424 6	2,259 5	3,604.0	4,140.3	80,066 3
Annual Totals	1,616.6	5,307 8	8,548 2	13,767 0	15,948 4	305,681.6
All Years Totals	8,082 8	26,538 9	42,741 2	68,835.1	159,483.6	305,681.6
Ghanzi District						
Capital Budgets	154 6	176 7	284 6	458 3	657.1	11,941.5
Council Recurrent Budgets	83.7	97.1	157 8	255 6	368 3	6,654 1
Householder Contributions	101 6	114 7	183 3	293 7	419 3	7,659 6
Annual Totals	339 9	388 5	625 6	1,007.6	1,444 7	26,255 1
All Years Totals	1,699 6	1,942 4	3,128.2	5,038 0	14,447 0	26,255 1
Kgalagadi District						
Capital Budgets	191 4	117 7	189 6	305 4	416 4	8,184 2
Council Recurrent Budgets	83 1	52.0	84.7	137.4	188.4	3,670.5
Householder Contributions	120.8	73.4	117.3	188.0	255 3	5,050 0
Annual Totals	395.2	243.2	391.6	630 7	860 1	16,904.8
All Years Totals	1,976 2	1,215.9	1,958 2	3,153.7	8,600 8	16,904.8
Kgatleng District						
Capital Budgets	421 5	573.3	923.3	1,486 9	2,285 1	39,875.7
Council Recurrent Budgets	426 6	587.9	954 5	1,544 9	2,384 3	41,412 5
Householder Contributions	217.2	287 7	455 6	726 1	1,105 6	19,489 5
Annual Totals	1,065 3	1,448.9	2,333 4	3,757.9	5,775.0	100,777 7
All Years Totals	5,326.4	7,244.3	11,667 0	18,789 7	57,750 3	100,777.7
Kweneng District						
Capital Budgets	543 4	479.8	772 7	1,244 4	1,898.3	34,184 9
Council Recurrent Budgets	504 0	453 8	739 5	1,199 7	1,841.6	32.901 2
Householder Contributions	490 8	424 7	675 2	1,078 7	1,634 0	29,687 1
Annual Totals	1,538 3	1,358 2	2,187 4	3,522 9	5,373 9	96,773.2
All Years Totals	7,691 4	6,791 1	10,937 1	17,614 3	53,739 3	96,773 2
North East District						
Capital Budgets	317 8	406 5	654.7	1,054 4	1,062 7	22,794.2
Council Recurrent Budgets	100 1	132 9	218 8	357.1	364 1	7,684 7
Householder Contributions	166 8	208 5	331.1	528 4	528 4	11,457 4
Annual Totals	584.6	747 9	1,204 6	1,940 0	1,955 1	41,936.3
All Years Totals	2,923 1	3,739 7	6,022.8	9,699.8	19,551 0	41,936 3
North West District						
Capital Budgets	343.3	1,407.5	2,266.8	3,650.8	4,972 6	88,068.3
Council Recurrent Budgets	105 9	444.6	726 2	1,179.9	1,619 1	28,473.6
Householder Contributions	199.1	806.0	1,287.8	2,063 8	2,799 1	49,774.8
Annual Totals	648.2	2,658.1	4,280.9	6,894 5	9,390 8	166,316 7
All Years Totals	3,241.2	13,290.5	21,404.6	34,472 3	93,908.2	166,316 7
Southern District						
Capital Budgets	363 3	654 6	1,054.2	1,697.8	2,266.0	41,508.9
Council Recurrent Budgets	226 8	416 5	678.7	1,100 9	1,478 4	26,897.9
Householder Contributions	173.1	304 0	481 7	767 9	1,015.8	18,791.4
Annual Totals	763 2	1,375 1	2,214.6	3,566 6	4,760 1	87,198.3
All Years Totals	3,816.0	6,875.3	11,072.8	17,832 9	47,601 3	87,198.3
South East District						
Capital Budgets	345.0	416.3	670.5	1,079.8	1,884 5	31,402 9
Council Recurrent Budgets	127 7	158.6	259 9	423.1	745 3	12,299 3
Householder Contributions	176 6	208.5	331 3	529 0	916 5	15,392 7
Annual Totals	649.3	783 4	1,261.7	2,031.9	3,546.3	59,094.8
All Years Totals	3,246.4	3,917.0	6,308.4	10,159.7	35,463.2	59,094.8
Costs of Implementing the Strategy	36.6	0.0	0 0	0.0	0.0	183.2
ALL DISTRICTS						
Capital Budgets	3,456.9	6,662.2	10,729 5	17,280.0	22,743 5	418,077.8
Council Recurrent Budgets	2,089.9	3,796.7	6,195 7	10,059 5	13,496 6	245,675 1
Householder Contributions	2,090 5	3,852 2	6,122.8	9,779.6	12,814 4	237,368 8
OVERALL ANNUAL TOTALS	7,637 3	14,311.0	23,048 0	37,119 1	49,054 5	901,121.7
OVERALL ALL YEARS TOTALS	38,186 3	71,555 1	115,240.2	185,595.5	490,544 7	901,121.7

TABLE E22 LATRINE DESLUDGING COST PROJECTIONS IN 1990 CONSTANT PRICES H/
(INCLUSIVE OF CONTINGENCIES)

STRATEGY OPTION 1

AVERAGE CAPACITY IN YEARS = 8

(Pula'000s, 1990 Constant Prices)

District	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Average Price Index, 1990 = 1 00	1 22	1.97	3 17	5.10	10.72	4 44
Central District	0	112	302	566	877	13,671
Ghanzi District	0	13	18	37	44	780
Kgalagadi District	0	16	17	36	34	685
Kgatleng District	0	35	53	108	124	2,220
Kweneng District	0	76	93	197	212	3,947
North East District	0	29	42	87	103	1,818
North West District	0	26	84	155	256	3,886
Southern District	0	34	60	120	160	2,671
South East District	0	19	27	55	67	1,173
OVERALL ANNUAL TOTALS	0	360	697	1,362	1,876	30,850
OVERALL ALL YEARS TOTALS	0	1,801	3,484	6,808	18,757	30,850
Council Recurrent Cost	0	1,711	3,310	6,467	17,819	29,308
Householder Contribution	0	90	174	340	938	1,543

TABLE E23 LATRINE DESLUDGING COST PROJECTIONS IN CURRENT PRICES H/
(INCLUSIVE OF CONTINGENCIES)

AVERAGE CAPACITY IN YEARS = 8

(Pula'000s, Current Prices)

District	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Average Price Index, 1990 = 1.00	1.22	1 97	3.17	5 10	10 72	4 44
Central District	0	136	369	691	1,071	16,692
Ghanzi District	0	16	22	46	53	953
Kgalagadi District	0	19	20	44	42	836
Kgatleng District	0	43	65	132	152	2,710
Kweneng District	0	93	113	241	258	4,820
North East District	0	35	52	106	125	2,220
North West District	0	32	103	190	312	4,745
Southern District	0	41	74	146	196	3,261
South East District	0	23	33	68	81	1,432
OVERALL ANNUAL TOTALS	0	2,199	4,254	8,312	22,903	37,669
OVERALL ALL YEARS TOTALS	0	10,996	21,271	41,561	229,031	302,859
Council Recurrent Cost	0	10,446	20,208	39,483	217,579	287,716
Householder Contribution	0	550	1,064	2,078	11,452	15,143

TABLE E24 NRSP AVERAGE ANNUAL LATRINE DESLUDGING NUMBERS

District	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Central District	0	510	1,380	2,583	4,004	62,404
Ghanzi District	0	60	83	171	199	3,561
Kgalagadi District	0	72	76	166	156	3,127
Kgatleng District	0	272	411	836	962	17,213
Kweneng District	0	474	576	1,223	1,312	24,487
North East District	0	180	263	538	637	11,277
North West District	0	120	386	709	1,166	17,739
Southern District	0	210	375	742	994	16,568
South East District	0	180	255	525	633	11,128
Annual Totals	0	2,078	3,803	7,492	10,064	167,504
All Years Totals	0	10,389	19,014	37,461	100,640	167,504

TABLE E25 CALCULATION OF ANNUAL LATRINE DESLUDGING REQUIREMENTS

STRATEGY OPTION 1 (A) PROVISION OF NEW LATRINES

Year	CDC	GDC	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC
1990	850	100	120	453	790	300	200	350	300
1991	850	100	120	453	790	300	200	350	300
1992	850	100	120	453	790	300	200	350	300
1993	850	100	120	453	790	300	200	350	300
1994	850	100	120	453	790	300	200	350	300
1995	1,733	71	46	383	433	238	509	392	225
1996	1,733	71	46	383	433	238	509	392	225
1997	1,733	71	46	383	433	238	509	392	225
1998	1,733	71	46	383	433	238	509	392	225
1999	1,733	71	46	383	433	238	509	392	225
2000	1,733	71	46	383	433	238	509	392	225
2001	1,733	71	46	383	433	238	509	392	225
2002	1,733	71	46	383	433	238	509	392	225
2003	1,733	71	46	383	433	238	509	392	225
2004	1,733	71	46	383	433	238	509	392	225
2005	1,733	71	46	383	433	238	509	392	225
2006	1,733	71	46	383	433	238	509	392	225
2007	1,733	71	46	383	433	238	509	392	225
2008	1,733	71	46	383	433	238	509	392	225
2009	1,733	71	46	383	433	238	509	392	225
2010	955	48	30	30	314	114	330	249	187
2011	955	48	30	30	314	114	330	249	187
2012	955	48	30	30	314	114	330	249	187
2013	955	48	30	30	314	114	330	249	187
2014	955	48	30	30	314	114	330	249	187
2015	955	48	30	30	314	114	330	249	187
2016	955	48	30	30	314	114	330	249	187
2017	955	48	30	30	314	114	330	249	187
2018	955	48	30	30	314	114	330	249	187
2019	955	48	30	30	314	114	330	249	187
(B) LATRINE EMPTYING SCHEDULE ASSUMING CAPACITY IN YEARS =							8		
1990	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0
1997	850	100	120	453	790	300	200	350	300
1998	850	100	120	453	790	300	200	350	300
1999	850	100	120	453	790	300	200	350	300
2000	850	100	120	453	790	300	200	350	300
2001	850	100	120	453	790	300	200	350	300
2002	1,733	71	46	383	433	238	509	392	225
2003	1,733	71	46	383	433	238	509	392	225
2004	1,733	71	46	383	433	238	509	392	225
2005	2,583	171	166	836	1,223	538	709	742	525
2006	2,583	171	166	836	1,223	538	709	742	525
2007	2,583	171	166	836	1,223	538	709	742	525
2008	2,583	171	166	836	1,223	538	709	742	525
2009	2,583	171	166	836	1,223	538	709	742	525
2010	3,466	142	92	765	866	477	1,018	783	450
2011	3,466	142	92	765	866	477	1,018	783	450
2012	3,466	142	92	765	866	477	1,018	783	450
2013	4,316	242	212	1,218	1,656	777	1,218	1,133	750
2014	4,316	242	212	1,218	1,656	777	1,218	1,133	750
2015	4,316	242	212	1,218	1,656	777	1,218	1,133	750
2016	4,316	242	212	1,218	1,656	777	1,218	1,133	750
2017	3,538	219	196	865	1,537	653	1,039	990	711
2018	4,421	190	121	795	1,181	591	1,348	1,032	636
2019	4,421	190	121	795	1,181	591	1,348	1,032	636

STRATEGY OPTION 2 (from 1995 onwards)

TABLE E10 ESTIMATED NRSP UNIT PROVISION COSTS: COUNCIL METHOD h/ i/

(Pula, 1990 Prices)

	CDC	GDC j/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Annual Number of Latrines	250	100	0	253	650	0	0	150	0	156
Project Overheads										
Supervision (R)	124 53	180 68	0.00	77.68	67.51	0.00	0.00	206 91	0 00	102 47
Health Education:										
Capital (D)	20.00	38 00	0.00	17.85	11 85	0.00	0.00	37 14	0 00	18 95
Council Staff (R)	0.00	0.00	0.00	0 00	10.49	0.00	0 00	0.00	0 00	4 86
Total	20 00	38 00	0 00	17.85	22.34	0.00	0.00	37 14	0 00	23 81
Vehicles										
Capital Charges (D)	200 49	224 23	0 00	172 04	66.96	0.00	0 00	281 39	0 00	143 84
Labour (R)	61.32	76 65	0.00	50 49	19.65	0 00	0 00	85 17	0 00	43 71
Other Recurrent (R)	143 31	153 73	0.00	124 70	48.54	0 00	0.00	206 98	0 00	103 60
Total	405.12	454 61	0 00	347.24	135 16	0.00	0.00	573 53	0.00	291 14
Sub-Total	549.65	673.29	0.00	442.77	225.01	0 00	0 00	817 58	0 00	417.43
Excavation										
Household Labour (H)	13.75	8.00	0.00	9.38	9.38	0.00	0.00	15.00	0 00	10 66
Compressor										
Capital Charges (D)	39.85	70.84	0.00	33.21	66.42	0.00	0.00	47.23	0 00	53.96
Labour (R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0.00	0 00
Other Recurrent (R)	23.36	41.54	0.00	19.47	38.94	0.00	0.00	27 69	0 00	31 64
Total	63.22	112 38	0.00	105.36	105.36	0.00	0.00	74 92	0 00	95.09
Sub-Total	76.97	120.38	0.00	114.73	114.73	0.00	0.00	89.92	0.00	105 75
Substructure										
Materials (D)	69.30	287.00	0.00	100 67	66.79	0.00	0 00	84 00	0 00	90 88
Labour (R)	244 00	221 28	0 00	367 69	141.84	0.00	0.00	154 16	0 00	207 75
Tools (D)	27.25	9 70	0.00	10.16	7.28	0.00	0 00	16 67	0 00	12 53
Sub-Total	340.55	517 98	0.00	478 51	215.90	0.00	0 00	254 82	0 00	311 16
Fittings										
Materials (D)	31.87	31 87	0.00	36.84	33 47	0.00	0.00	52 50	0 00	35 71
Labour (R)	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0 00
Sub-Total	31.87	31.87	0.00	36.84	33.47	0.00	0.00	52 50	0 00	35 71
Superstructure										
Materials (H)	118.65	307 90	0 00	106.83	159.64	0.00	0.00	106.83	0.00	147 73
Materials (R)	0.00	0.00	0.00	12.50	14.25	0.00	0.00	12 50	0.00	10 19
Labour (H)	50.00	50 00	0.00	50.00	50.00	0.00	0.00	50.00	0.00	50 00
Sub-Total	168.65	357.90	0.00	169.33	223.89	0.00	0.00	169.33	0 00	207.92
OVERALL TOTAL	1,167.68	1,701 42	0 00	1,242.17	812.99	0.00	0.00	1,384 15	0.00	1,077 97

STRATEGY OPTION 2 (from 1995 onwards)

TABLE E11 ESTIMATED NRSP UNIT PROVISION COSTS: CONTRACTOR METHOD h/ i/

(Pula, 1990 Prices)

	CDC	GDC j/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Annual Number of Latrines	600	100	120	200	140	300	200	200	300	240
Project Overheads										
Supervision (R)	53 66	139 48	188 29	32 86	70.33	97.69	137.64	42.46	75.68	80 18
Health Education										
Capital (D)	20 00	38.00	58 33	17.85	11.85	30 17	101 28	37.14	26 46	33 66
Council Staff (R)	0 00	0 00	0 00	0 00	10.49	36.76	26 94	0 00	0.00	8 28
Total	20 00	38.00	58.33	17.85	22.34	66.93	128 22	37 14	26 46	41 94
Vehicles										
Capital Charges (D)	52 76	224 23	197 85	32 98	47.11	35 17	145.09	26.38	35 17	67 78
Labour (R)	25 55	76 65	63 88	12 78	18 25	17 03	51.10	12.78	17.03	27 21
Other Recurrent (R)	37 75	153 73	145 09	21 39	30 56	36.99	102.97	18.88	25 16	49 54
Total	116 06	454 61	406 82	67 14	95.91	89.20	299 16	58 03	77 37	144 53
Sub-Total	189 72	632 09	653.44	117 85	188.58	253 82	565 02	137.63	179 51	266 64
Excavation										
Household Labour (H)	13 75	8 00	8.00	9.38	9.38	40.00	18.75	15.00	12.50	16 53
Compressor										
Capital Charges (D)	39 85	70 85	53.14	66.42	66.42	17.71	22 14	47.23	88 56	48 94
Labour (R)	23 63	42 00	31.50	39 37	39 37	10 50	13.13	28.00	52 50	29 01
Other Recurrent (R)	23 36	41 53	31 15	38 94	38 94	10.38	12 98	27.69	51.91	28 69
Total	86 84	154 38	115.79	144 73	144 73	38.60	48.25	102.92	192.98	106 64
Tools (D)	0.00	0 00	0.00	0.00	0.00	10 17	0.00	0.00	0.00	1.41
Sub-Total	100 59	162 38	123 79	154.11	154.11	88 76	67.00	117.92	205.48	124 58
Substructure										
Contractor (D)	235 00	60 00	100 00	265 00	325.00	300 00	175 00	275 00	275 00	240 74
Other Materials (D)	0 00	287 00	262 20	0 00	0 00	0 00	471 00	0.00	0 00	71 46
Tools (D)	0.00	9 70	18 34	0 00	0 00	0 00	86.95	0 00	0 00	9 52
Council Labour (R)	0 00	0 00	0 00	0.00	0.00	0.00	48.00	0.00	0 00	4 44
Sub-Total	235.00	356 70	380.54	265 00	325.00	300.00	780.95	275 00	275 00	326 17
Fittings										
Materials (D)	31 87	31.87	31 87	36 84	33 47	33 77	39 62	52 50	33 77	35 59
Labour (R)	0.00	7 37	8.75	7.37	7.37	7.37	0.00	5.49	7.37	4 54
Sub-Total	31.87	39 23	40.62	44.20	40.83	41.13	39.62	57.99	41.13	40.13
Superstructure										
Materials (H)	118 65	307 90	284.50	106 83	159 64	104 65	289.50	106.83	119.33	151.06
Materials (R)	0.00	0.00	0 00	12.50	14.25	14.00	0.00	12.50	0 00	5 18
Labour (H)	50.00	50 00	70.00	50.00	50.00	50.00	50.00	50.00	75.00	54.58
Sub-Total	168.65	357.90	354 50	169.33	223.89	168.65	339.50	169.33	194 33	210 83
OVERALL TOTAL	725 82	1,548.30	1,552 87	750 49	932 40	852.36	1,792 09	757.87	895 45	968 35

TABLE E12 STRATEGY OPTION 2 (from 1995 onwards)
SUMMARY OF NRSP UNIT PROVISION COSTS h/
(Pula, 1990 Prices)

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Project Overheads	549 65	673 29	0.00	442 77	225.01	0.00	0.00	817 58	0 00	417 43
Excavation	76 97	120.38	0 00	114 73	114 73	0.00	0.00	89.92	0 00	105.75
Substructure	340 55	517 98	0.00	478.51	215.90	0.00	0.00	254.82	0 00	311 16
Fittings	31.87	31.87	0.00	36 84	33.47	0.00	0.00	52.50	0 00	35 71
Superstructure	168 65	357 90	0.00	169.33	223.89	0.00	0.00	169.33	0 00	207 92
OVERALL TOTAL	1,167.68	1,701 42	0.00	1,242.17	812.99	0.00	0.00	1,384.15	0.00	1,077 97
Contractor Delivery Method										
Project Overheads	189 72	632.09	653.44	117 85	188.58	253.82	565.02	137.63	179 51	266 64
Excavation	100.59	162.38	123 79	154 11	154.11	88.76	67.00	117.92	205 48	124 58
Substructure	235 00	356 70	380 54	265 00	325 00	300.00	780 95	275 00	275 00	326 17
Fittings	31 87	39 23	40 62	44 20	40 83	41.13	39.62	57.99	41.13	40 13
Superstructure	168.65	357.90	354 50	169 33	223.89	168 65	339 50	169.33	194 33	210.83
OVERALL TOTAL	725 82	1,548 30	1,552.87	750 49	932 40	852.36	1,792.09	757 87	895 45	968 35

TABLE E13 STRATEGY OPTION 2 (from 1995 onwards)
SUMMARY OF PERCENTAGE NRSP UNIT PROVISION COSTS h/

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Project Overheads	47 1%	39 6%	0 0%	35 6%	27 7%	0.0%	0.0%	59 1%	0 0%	36 8%
Excavation	6 6%	7 1%	0 0%	9.2%	14.1%	0.0%	0.0%	6 5%	0 0%	10 6%
Substructure	29 2%	30 4%	0 0%	38 5%	26.6%	0.0%	0.0%	18 4%	0 0%	28 6%
Fittings	2.7%	1 9%	0 0%	3 0%	4.1%	0.0%	0.0%	3.8%	0 0%	3 5%
Superstructure	14.4%	21 0%	0.0%	13.6%	27.5%	0.0%	0.0%	12.2%	0.0%	20 6%
OVERALL TOTAL	100 0%	100 0%	0.0%	100 0%	100.0%	0.0%	0.0%	100.0%	0.0%	100 0%
Contractor Delivery Method										
Project Overheads	26 1%	40.8%	42 1%	15 7%	20.2%	29.8%	31.5%	18 2%	20 0%	25 8%
Excavation	13.9%	10 5%	8 0%	20 5%	16 5%	10.4%	3.7%	15.6%	22 9%	14 2%
Substructure	32 4%	23 0%	24.5%	35.3%	34.9%	35.2%	43.6%	36.3%	30 7%	33 5%
Fittings	4 4%	2.5%	2.6%	5 9%	4 4%	4.8%	2.2%	7.7%	4.6%	4 5%
Superstructure	23.2%	23.1%	22.8%	22 6%	24.0%	19.8%	18.9%	22.3%	21 7%	22 0%
OVERALL TOTAL	100 0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100 0%

TABLE E14 STRATEGY OPTION 2 (from 1995 onwards)
ANALYSIS OF NRSP UNIT PROVISION COSTS BY TYPE h/
(Pula, 1990 Prices)

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Supervision & Administration	124.53	180.68	0.00	77.68	78.00	0.00	0.00	206.91	0 00	107 33
Labour	369.07	355 93	0.00	477.55	220.87	0.00	0 00	304 32	0 00	312 11
Materials & Equipment	674.08	1,164 81	0.00	634.26	514.12	0.00	0.00	872.92	0 00	649.03
OVERALL TOTAL	1,167.68	1,701.42	0.00	1,189 49	812.99	0.00	0.00	1,384 15	0.00	1,068 47
Contractor Delivery Method										
Supervision & Administration	53.66	139.48	188.29	32.86	80.82	134.45	164.58	42.46	75.68	88 46
Contract Costs	235.00	60.00	100.00	265 00	325.00	300.00	175.00	275.00	275 00	240 74
Other Labour	112.93	184.02	182.13	118.89	124.36	124.90	180.98	111.27	164 40	136.31
Other Materials & Equipment	324.23	1,164.80	1,082.46	333.73	402.22	293.01	1,271.53	329 14	380 37	502 83
OVERALL TOTAL	725.82	1,548.30	1,552.87	750.48	932.40	852.36	1,792.08	757.87	895 44	958 35

STRATEGY OPTION 2 (from 1995 onwards)

TABLE E15 ANALYSIS OF PERCENTAGE NRSP UNIT PROVISION COSTS BY TYPE h/

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Council Delivery Method										
Supervision & Administration	10 7%	10 6%	0 0%	6.5%	9 6%	0.0%	0.0%	14.9%	0 0%	9 9%
Labour	31 6%	20 9%	0 0%	40 1%	27 2%	0 0%	0.0%	22.0%	0 0%	29 3%
Materials & Equipment	57 7%	68 5%	0 0%	53.3%	63.2%	0 0%	0.0%	63.1%	0 0%	60.8%
OVERALL TOTAL	100 0%	100 0%	0.0%	100 0%	100.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Contractor Delivery Method										
Supervision & Administration	7 4%	9.0%	12 1%	4.4%	8 7%	15.8%	9.2%	5.6%	8.5%	8.8%
Contract Costs	32 4%	3.9%	6.4%	35 3%	34.9%	35.2%	9 8%	36 3%	30.7%	28 5%
Other Labour	15 6%	11 9%	11.7%	15 8%	13 3%	14 7%	10 1%	14.7%	18 4%	14 7%
Other Materials & Equipment	44 7%	75.2%	69 7%	44.5%	43 1%	34 4%	71.0%	43.4%	42 5%	47.9%
OVERALL TOTAL	100.0%	100 0%	100 0%	100.0%	100.0%	100.0%	100 0%	100 0%	100.0%	100.0%

STRATEGY OPTION 2 (from 1995 onwards)

TABLE E16 ANALYSIS OF UNIT NRSP PROVISION COSTS BY BUDGET CATEGORY h/
(Pula, 1990 Prices)

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Council Delivery Method										
Development Expenditures										
Capital Budget	388 75	661.64	0 00	370 76	252.76	0 00	0.00	518.92	0 00	355 87
Recurrent Budget k/	566 52	643 88	0 00	622 53	311.22	0 00	0.00	663.40	0.00	474.21
Householder k/										
Labour/Materials	182 40	365 90	0.00	166.21	219.01	0.00	0.00	171.83	0 00	208.39
Registration Fee	30 00	30.00	0.00	30.00	30.00	0 00	0.00	30.00	0.00	30.00
Reduced Subsidies	0 00	0.00	0.00	0.00	0.00	0.00	0 00	0.00	0 00	0.00
Total	212 40	395 90	0 00	196 21	249.01	0.00	0.00	201.83	0 00	238 39
Sub-Total	1,167.68	1,701 42	0.00	1,189 49	812.99	0.00	0.00	1,384.15	0.00	1,068 47
Contractor Delivery Method										
Development Expenditures										
Capital Budget	379.48	721.64	721.72	419.08	483.84	426.99	1,041.08	438.25	458 96	509 10
Recurrent Budget k/	133.94	430.76	438.66	135.20	199.55	200.72	362.75	117.79	199 66	207 07
Householder k/										
Labour/Materials	182 40	365.90	362.50	166 21	219.01	194.65	358.25	171.83	206 83	222 17
Registration Fee	30 00	30.00	30.00	30.00	30.00	30.00	30 00	30.00	30 00	30 00
Reduced Subsidies	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0 00
Total	212 40	395 90	392 50	196 21	249.01	224.65	388.25	201.83	236 83	252 17
Sub-Total	725.82	1,548 30	1,552.87	750 48	932.40	852.36	1,792.08	757.87	895 44	968 35

STRATEGY OPTION 2 (from 1995 onwards)

TABLE E17 ANALYSIS OF PERCENTAGE NRSP PROVISION COSTS BY BUDGET CATEGORY h/

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Council Delivery Method										
Development Expenditures a/										
Capital Budget	33.3%	38 9%	0.0%	31.2%	31.1%	0.0%	0.0%	37.5%	0 0%	32 7%
Council Recurrent b/	48 5%	37 8%	0.0%	52.3%	38.3%	0.0%	0.0%	47.9%	0.0%	43 6%
Householder b/										
Labour/Materials	15.6%	21.5%	0.0%	14.0%	26.9%	0.0%	0.0%	12.4%	0 0%	20 6%
Registration Fee	2.6%	1.8%	0.0%	2.5%	3.7%	0.0%	0.0%	2.2%	0 0%	3 0%
Reduced Subsidies	0.0%	0 0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 0%	0 0%
Sub-Total	18 2%	23.3%	0 0%	16 5%	30.6%	0.0%	0.0%	14 6%	0.0%	23 6%
Total	100 0%	100 0%	0.0%	100.0%	100.0%	0.0%	0.0%	100 0%	0.0%	100 0%
Contractor Delivery Method										
Development Expenditures a/										
Capital Budget	52 3%	46 6%	46 5%	55 8%	51.9%	50.1%	58 1%	57 8%	51.3%	52 6%
Council Recurrent b/	18.5%	27 8%	28.2%	18.0%	21.4%	23.5%	20.2%	15 5%	22 3%	20 7%
Householder b/										
Labour/Materials	25 1%	23 6%	23.3%	22 1%	23.5%	22.8%	20.0%	22.7%	23 1%	23 3%
Registration Fee	4.1%	1.9%	1 9%	4.0%	3.2%	3.5%	1.7%	4.0%	3 4%	3 4%
Reduced Subsidies	0 0%	0 0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 0%
Sub-Total	29.3%	25.6%	25.3%	26.1%	26.7%	26.4%	21 7%	26 6%	26 4%	26 7%
Total	100.0%	100 0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100 0%	100 0%

STRATEGY OPTION 2 **ASSUMPTIONS FOR NRSP ANNUAL COST PROJECTIONS**

1) Level of Coverage	= 60%	3) GoB Subsidy for Desludging of Latrines	N/A
2) GoB Subsidy for Usage of Compressor	= 100%	4) GoB Subsidy for Substructure & Fittings	= 100%
5) Rate of Inflation	= 10%	6) Inflation Linking of Registration Fees	FALSE
7) Contingencies	= 10%	8) Average Latrine Capacity (8, 12 or 16 Years)	N/A

9) Annual Latrine Provision

	1990-94	1995-99	2000-04	2005-10	2010-19	All Years 1990-2019
Central District	850	1,733	1,733	1,733	955	39,794
Ghanzi District	100	71	71	71	48	2,048
Kgalagadi District	120	46	46	46	30	1,585
Kgatleng District	453	383	383	383	280	10,800
Kweneng District	790	433	433	433	314	13,590
North East District	300	238	238	238	114	6,217
North West District	200	509	509	509	330	11,938
Southern District	350	392	392	392	249	10,109
South East District	300	225	225	225	187	6,737
Annual Totals	3,463	4,029	4,029	4,029	2,506	102,818

10) Use of Council & Contractor Delivery Methods

	CDC	GDC i/ l/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC
Existing									
Council Method	29%	N/A	0%	56%	82%	0%	0%	43%	0%
Contractor Method	71%	N/A	100%	44%	18%	100%	100%	57%	100%
Assumed m/									
Council Method	29%	25%	0%	56%	82%	0%	0%	43%	0%
Contractor Method	71%	75%	100%	44%	18%	100%	100%	57%	100%

11) Rough Additional Costs of Implementing Strategy (Pula'000s)

Workshops etc	150
Latrine Technology R&D	750
H/Education Development	0
Sub-total	900

12) Provision costs for 1990-94 are based on existing approach. From 1995 onwards revised costs of implementation have been based on improved technology are used.

TABLE E19 SUMMARY OF COST PROJECTIONS, INCLUSIVE OF CONTINGENCIES h/

(Total Costs for All Years in Pula'000s, 1990 Constant Prices)

STRATEGY OPTION 2

	1990-94	1995-99	2000-04	2005-10	2010-19	All Years 1990-2019
Programme Costs						
Central District	6,620	8,156	8,156	8,156	8,990	40,079
Ghanzi District	1,392	619	619	619	845	4,094
Kgalagadi District	1,619	392	392	392	608	3,301
Kgatleng District	4,362	2,095	2,095	2,095	3,063	13,710
Kweneng District	6,299	1,987	1,987	1,987	2,884	15,144
North East District	2,394	1,117	1,117	1,117	1,071	6,817
North West District	2,655	5,019	5,019	5,019	6,504	24,216
Southern District	3,125	2,210	2,210	2,210	2,806	12,562
South East District	2,659	1,107	1,107	1,107	1,838	7,818
Sub-total	31,124	22,702	22,702	22,702	28,509	127,741
Costs of Implementing Strategy	900	0	0	0	0	900
TOTAL	32,024	22,702	22,702	22,702	28,509	128,641
Funding of Programme Costs						
Capital Budgets	14,906	10,686	10,686	10,686	13,399	60,363
Council Recurrent Budgets	8,558	6,950	7,078	7,158	9,096	38,839
Householder Contributions	8,560	5,066	4,938	4,859	6,014	29,438
TOTAL	32,024	22,702	22,702	22,702	28,509	128,641
Latrine Desludging Costs						
Council Recurrent Budgets	0	0	0	0	0	0
Householder Contributions	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0
OVERALL COSTS	32,024	22,702	22,702	22,702	28,509	128,641

TABLE E20 NRSP ANNUAL COST PROJECTIONS IN 1990 CONSTANT PRICES h/ (INCLUSIVE OF CONTINGENCIES)

STRATEGY OPTION 2

(Annual Costs in Pula'000s, 1990 Constant Prices)

	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Average Price Index, 1990 = 1 00	1.22	1 97	3 17	5.10	10.72	4 44
Central District						
Capital Budgets	606.1	728 6	728 6	728 6	401.5	17,973 8
Council Recurrent Budgets	353 8	526 0	537 0	543.8	302.9	12,832.1
Householder Contributions	364 1	376 8	365 7	358.9	194.5	9,272 9
Annual Totals	1,323.9	1,631 3	1,631 3	1,631 3	899 0	40,078.6
All Years Totals	6,619 7	8,156 5	8,156.5	8,156.5	8,989.8	40,078 8
Ghanzi District						
Capital Budgets	126.6	55.2	55.2	55 2	37 6	1,836 7
Council Recurrent Budgets	68.6	38 9	39 4	39 7	27.2	1,205 0
Householder Contributions	83.2	29.8	29 3	29 0	19.6	1,052 7
Annual Totals	278 4	123 8	123 8	123 8	84.5	4,094 4
All Years Totals	1,391.9	619.2	619.2	619 2	844 7	4,094 3
Kgalagadi District						
Capital Budgets	156 7	36 4	36 4	36.4	23.6	1,565 6
Council Recurrent Budgets	68.0	22 9	23.2	23.3	15.2	839.4
Householder Contributions	98.9	19.0	18.8	18.6	11.9	896.1
Annual Totals	323 7	78 3	78 3	78.3	50.8	3,301 1
All Years Totals	1,618 5	391.5	391.5	391 5	508.0	3,301.1
Kgatleng District						
Capital Budgets	345.2	165.0	165.0	165 0	120.6	5,407.2
Council Recurrent Budgets	349.4	177 6	180.1	181 6	133.7	5,780 1
Householder Contributions	177.9	76.4	73.9	72.4	52.0	2,522.8
Annual Totals	872 5	419 0	419.0	419 0	306.3	13,710.3
All Years Totals	4,362.3	2,094.9	2,094 9	2,094.9	3,063.0	13,710.1
Kweneng District						
Capital Budgets	445.0	139 9	139 9	139 9	101.5	5,339.5
Council Recurrent Budgets	412 8	145 9	148 6	150 3	110.2	5,389 8
Householder Contributions	402 0	111.6	108 9	107 1	76.7	4,414 8
Annual Totals	1,259 8	397 4	397.4	397 4	288 4	15,143 9
All Years Totals	6,299 1	1,987 0	1,987.0	1,987 0	2,883 8	15,144 0
North East District						
Capital Budgets	260.2	111.9	111.9	111.9	53 7	3,516 8
Council Recurrent Budgets	82.0	56 5	58.0	58 9	28.6	1,563 4
Householder Contributions	136.6	55 0	53 5	52.6	24.8	1,736 6
Annual Totals	478 8	223.4	223 4	223 4	107 1	6,816 8
All Years Totals	2,394.0	1,117.2	1,117.2	1,117.2	1,071.2	6,816 8
North West District						
Capital Budgets	281.1	583 1	583.1	583.1	377 9	13,931.4
Council Recurrent Budgets	86 7	211.5	214.7	216.7	141 5	5,063.2
Householder Contributions	163.0	209.2	206.0	204.0	131.0	5,221.3
Annual Totals	530.9	1,003.8	1,003.8	1,003.8	650.4	24,215.9
All Years Totals	2,654.5	5,019.1	5,019.1	5,019.1	6,504.2	24,215.9
Southern District						
Capital Budgets	297.5	203.6	203.6	203 6	129.3	5,835.4
Council Recurrent Budgets	185.7	157.8	160.3	161.8	103.6	4,364.2
Householder Contributions	141.8	80.6	78.1	76.5	47.8	2,362 4
Annual Totals	625 1	442 0	442.0	442.0	280.6	12,562.3
All Years Totals	3,125.3	2,210.1	2,210.1	2,210.1	2,806 4	12,562.1
South East District						
Capital Budgets	282 6	113.5	113.5	113.5	94.2	4,057.0
Council Recurrent Budgets	104 6	53 0	54.4	55.3	46.6	1,802 3
Householder Contributions	144.6	54.9	53.5	52.6	43.0	1,958.2
Annual Totals	531.8	221.4	221 4	221.4	183 8	7,817.7
All Years Totals	2,658 8	1,106.9	1,106 9	1,106.9	1,838.0	7,817.5
Costs of Implementing the Strategy	180 0	0	0	0	0	900.0
ALL DISTRICTS						
Capital Budgets	2,981.1	2,137 2	2,137.2	2,137.2	1,339.9	60,363 4
Council Recurrent Budgets	1,711.6	1,390 0	1,415 6	1,431.5	909 6	38,839 5
Householder Contributions	1,712 1	1,013.3	987.6	971.7	601 4	29,437.9
OVERALL ANNUAL TOTALS	6,404.8	4,540.5	4,540.5	4,540.5	2,850 9	128,640 7
OVERALL ALL YEARS TOTALS	32,024.1	22,702.5	22,702.5	22,702.5	28,509 2	128,640.7

TABLE E21 NRSP ANNUAL COST PROJECTIONS IN CURRENT PRICES h/
(INCLUSIVE OF CONTINGENCIES)

STRATEGY OPTION 2

(Annual Costs in Pula'000s, Current Prices)

	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Average Price Index, 1990 = 1 00	1.22	1 97	3.17	5.10	10 72	4.44
Central District						
Capital Budgets	740.0	1,432.7	2,307 4	3,716 0	4,304.8	84,029.1
Council Recurrent Budgets	432 0	1,034.3	1,700.6	2,773.8	3,248 0	62,183.2
Householder Contributions	444 5	740.9	1,158 3	1,830.6	2,085.9	41,730 9
Annual Totals	1,616.6	3,207.9	5,166 3	8,320.4	9,638.7	187,943.2
All Years Totals	8,082 8	16,039 4	25,831.6	41,602 0	96,387.5	187,943.2
Ghanzi District						
Capital Budgets	154 6	108 5	174.7	281.3	403 4	7,629 4
Council Recurrent Budgets	83.7	76 6	124.7	202 3	291 8	5,355.1
Householder Contributions	101 6	58 5	92 8	148 0	210 5	4,109 3
Annual Totals	339.9	243.5	392 2	631.7	905 7	17,093.8
All Years Totals	1,699 6	1,217 7	1,961 1	3,158 4	9,057 0	17,093.8
Kgalagadi District						
Capital Budgets	191 4	71 6	115 3	185 6	253 1	5,350 3
Council Recurrent Budgets	83 1	45 0	73.3	119 0	163 4	3,235 9
Householder Contributions	120 8	37 5	59.4	94 7	128 1	2,843.3
Annual Totals	395 2	154 0	248 0	399 4	544 6	11,429.4
All Years Totals	1,976 2	769 9	1,240 0	1,997.0	5,446 3	11,429.4
Kgatleng District						
Capital Budgets	421 5	324 5	522 5	841.6	1,293 3	23,483 1
Council Recurrent Budgets	426 6	349.3	570.3	926.1	1,433 4	25,695 4
Householder Contributions	217 2	150 2	234 1	369 4	557 4	10,428.6
Annual Totals	1,065 3	823.9	1,326.9	2,137 0	3,284 1	59,607.1
All Years Totals	5,326 4	4,119.6	6,634 7	10,685.2	32,841.1	59,607.1
Kweneng District						
Capital Budgets	543 4	275 2	443.2	713 7	1,088 7	20,764.2
Council Recurrent Budgets	504 0	286 8	470.7	766.8	1,181.1	21,953.0
Householder Contributions	490 8	219 5	344.7	546 5	822.2	16,229 7
Annual Totals	1,538 3	781 5	1,258 6	2,027.0	3,092 0	58,946 9
All Years Totals	7,691 4	3,907 4	6,293 0	10,134 9	30,920 3	58,946 9
North East District						
Capital Budgets	317 8	220 1	354 5	570 9	575.4	13,070 0
Council Recurrent Budgets	100 1	111 1	183 7	300 6	307 1	6,548.7
Householder Contributions	166 8	108 2	169 5	268 1	266 1	6,223 4
Annual Totals	584.6	439.4	707.6	1,139 7	1,148 6	25,842.2
All Years Totals	2,923.1	2,196.9	3,538.2	5,698 3	11,485 6	25,842.2
North West District						
Capital Budgets	343 3	1,146.7	1,846.8	2,974.3	4,051.3	72,068.8
Council Recurrent Budgets	105.9	415.8	679.9	1,105.3	1,517.5	26,709.6
Householder Contributions	199 1	411 4	652.3	1,040.3	1,405 0	25,565.6
Annual Totals	648.2	1,974 0	3,179 1	5,119.9	6,973.8	124,344.0
All Years Totals	3,241 2	9,869 8	15,895.4	25,599.7	69,737.9	124,344.0
Southern District						
Capital Budgets	363.3	400 5	645.0	1,038.7	1,386.3	26,100.4
Council Recurrent Budgets	226 8	310.3	507.6	825 4	1,110 7	20,457 9
Householder Contributions	173.1	158 5	247 3	390 4	512.0	9,966 4
Annual Totals	763.2	869 2	1,399 9	2,254 5	3,009 0	56,524 7
All Years Totals	3,816 0	4,346 1	6,999 5	11,272.7	30,090 3	56,524 7
South East District						
Capital Budgets	345.0	223.1	359 4	578 7	1,010 1	17,632 1
Council Recurrent Budgets	127 7	104 2	172 4	282.2	499 3	8,425 1
Householder Contributions	176 6	108 0	169 4	268 2	461.3	8,224 2
Annual Totals	649.3	435 3	701.1	1,129 2	1,970 7	34,281.4
All Years Totals	3,246 4	2,176.7	3,505 6	5,645 8	19,706.9	34,281.4
Costs of Implementing the Strategy	219.8	0.0	0.0	0.0	0.0	1098 9
ALL DISTRICTS						
Capital Budgets	3,640 0	4,202.8	6,768.7	10,901.0	14,366.4	271,226.3
Council Recurrent Budgets	2,089 9	2,733 4	4,483.3	7,301.6	9,752.3	180,563.9
Householder Contributions	2,090.5	1,892.6	3,127.9	4,956.3	6,448.6	125,321.4
OVERALL ANNUAL TOTALS	7,820 4	8,928 7	14,379 8	23,158 8	30,567.3	577,111.7
OVERALL ALL YEARS TOTALS	39,102 1	44,643.6	71,899.0	115,794 1	305,672.9	577,111.7

STRATEGY OPTION 3 (from 1995 onwards)

TABLE E10 ESTIMATED NRSP UNIT PROVISION COSTS: COUNCIL METHOD h/ i/

(Pula, 1990 Prices)

	CDC	GDC j/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Annual Number of Latrines	250	100	0	253	650	0	0	150	0	156
Project Overheads										
Supervision (R)	68.01	68.01	0.00	68 01	68.01	0 00	0.00	68 01	68 01	68 01
Health Education:										
Capital (D)	30 00	30 00	0 00	30 00	30.00	0 00	0.00	30.00	0.00	30 00
Council Staff (R)	70 79	70.79	0.00	70 79	70.79	0.00	0.00	70.79	0 00	70 79
Total	100.79	100 79	0.00	100 79	100.79	0.00	0.00	100 79	0 00	100 79
Vehicles										
Capital Charges (D)	200.49	224.23	0.00	172 04	66.96	0.00	0 00	281.39	0 00	143 84
Labour (R)	61.32	76 65	0 00	50 49	19.65	0.00	0 00	85 17	0 00	43 71
Other Recurrent (R)	143 31	153.73	0 00	124 70	48 54	0.00	0.00	206.98	0 00	103 60
Total	405 12	454 61	0.00	347 24	135.16	0.00	0.00	573.53	0 00	291.14
Sub-Total	573.91	623 40	0.00	516.04	303.95	0.00	0.00	742.33	0 00	459 94
Excavation										
Household Labour (H)	13.75	8.00	0.00	9.38	9.38	0.00	0.00	15.00	0 00	10 66
Compressor.										
Capital Charges (H)	39.85	70.84	0.00	33.21	66.42	0.00	0.00	47.23	0 00	53 96
Labour (H)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0 00
Other Recurrent (H)	23.36	41.54	0.00	19.47	38.94	0.00	0.00	27.69	0 00	31 64
Total	63 22	112.38	0.00	105 36	105 36	0.00	0 00	74 92	0 00	95 09
Sub-Total	76.97	120.38	0 00	114.73	114 73	0.00	0 00	89 92	0 00	105 75
Substructure										
Materials (H)	69 30	287.00	0 00	100 67	66.79	0.00	0.00	84.00	0 00	90 88
Labour (H)	244.00	221 28	0.00	367.69	141.84	0.00	0.00	154.16	0 00	207 75
Tools (H)	27.25	9.70	0.00	10.16	7.28	0.00	0.00	16 67	0.00	12.53
Sub-Total	340.55	517.98	0.00	478.51	215.90	0.00	0.00	254.82	0 00	311 16
Fittings										
Materials (H)	31.87	31.87	0.00	36.84	33.47	0.00	0.00	52.50	0.00	35 71
Labour (H)	0.00	0 00	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0 00
Sub-Total	31.87	31.87	0.00	36.84	33.47	0.00	0.00	52.50	0.00	35 71
Superstructure										
Materials (H)	118.65	307.90	0.00	106 83	159.64	0.00	0.00	106.83	0 00	147 73
Materials (H)	0.00	0.00	0.00	12.50	14.25	0.00	0.00	12.50	0 00	10 19
Labour (H)	50.00	50.00	0.00	50.00	50.00	0.00	0.00	50.00	0 00	50 00
Sub-Total	168.65	357.90	0.00	169 33	223.89	0.00	0.00	169.33	0.00	207 92
OVERALL TOTAL	1,191 94	1,651.53	0 00	1,315.44	891 93	0.00	0 00	1,308.90	0 00	1,120 48

STRATEGY OPTION 3 (from 1995 onwards)

TABLE E11 ESTIMATED NRSP UNIT PROVISION COSTS: CONTRACTOR METHOD h/ i/

(Pula, 1990 Prices)

	CDC	GDC j/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Annual Number of Latrines	600	100	120	200	140	300	200	200	300	240
Project Overheads										
Supervision (R)	68 01	68.01	68.01	68.01	68.01	68 01	68 01	68 01	68 01	68.01
Health Education										
Capital (D)	30 00	30 00	30 00	30 00	30 00	30 00	30 00	30 00	30 00	30.00
Council Staff (R)	70 79	70 79	70.79	70.79	70 79	70.79	70.79	70.79	70 79	70.79
Total	100 79	100 79	100 79	100 79	100.79	100.79	100 79	100 79	100 79	100.79
Vehicles										
Capital Charges (D)	52 76	224 23	197.85	32.98	47.11	35 17	145.09	26.38	35 17	67 78
Labour (R)	25 55	76.65	63.88	12 78	18.25	17.03	51.10	12.78	17.03	27.21
Other Recurrent (R)	37 75	153 73	145.09	21.39	30.56	36 99	102.97	18 88	25.16	49 54
Total	116.06	454 61	406.82	67.14	95.91	89 20	299 16	58.03	77 37	144.53
Sub-Total	284 85	623 40	575.61	235.93	264.71	257 99	467.95	226 82	246 16	313 32
Excavation										
Household Labour (H)	13 75	8.00	8.00	9.38	9 38	40.00	18.75	15 00	12 50	16 53
Compressor										
Capital Charges (H)	39.85	70 85	53.14	66.42	66 42	17 71	22 14	47 23	88 56	48 94
Labour (H)	23 63	42 00	31.50	39.37	39.37	10.50	13.13	28 00	52 50	29 01
Other Recurrent (H)	23.36	41.53	31.15	38.94	38.94	10 38	12.98	27.69	51 91	28 69
Total	86 84	154 38	115.79	144 73	144.73	38 60	48.25	102.92	192.98	106 64
Tools (H)	0.00	0.00	0.00	0.00	0 00	10 17	0.00	0.00	0 00	1 41
Sub-Total	100.59	162.38	123.79	154.11	154 11	88 76	67.00	117.92	205 48	124.58
Substructure										
Contractor (H)	235 00	60.00	100 00	265.00	325 00	300.00	175.00	275 00	275 00	240 74
Other Materials (H)	0.00	287 00	262 20	0.00	0 00	0.00	471 00	0 00	0.00	71 46
Tools (H)	0 00	9.70	18.34	0 00	0.00	0.00	86.95	0.00	0.00	9.52
Other Labour (H)	0 00	0 00	0 00	0 00	0.00	0 00	48 00	0 00	0 00	4 44
Sub-Total	235 00	356.70	380.54	265.00	325.00	300.00	780 95	275.00	275.00	326 17
Fittings										
Materials (H)	31 87	31 87	31.87	36 84	33 47	33 77	39 62	52 50	33 77	35 59
Labour (H)	0.00	7.37	8 75	7.37	7.37	7.37	0.00	5.49	7 37	4 54
Sub-Total	31 87	39.23	40.62	44.20	40.83	41 13	39.62	57.99	41.13	40.13
Superstructure										
Materials (H)	118 65	307.90	284 50	106 83	159 64	104.65	289.50	106 83	119 33	151 06
Materials (H)	0.00	0.00	0.00	12.50	14.25	14.00	0.00	12.50	0 00	5 18
Labour (H)	50.00	50.00	70.00	50.00	50.00	50.00	50 00	50.00	75.00	54 58
Sub-Total	168.65	357 90	354.50	169.33	223.89	168.65	339.50	169.33	194 33	210 83
OVERALL TOTAL	820 95	1,539 61	1,475 05	868.57	1,008 53	856.53	1,695 02	847.06	962 10	1,015 03

TABLE E12 STRATEGY OPTION 3 (from 1995 onwards)
SUMMARY OF NRSP UNIT PROVISION COSTS h/
(Pula, 1990 Prices)

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Project Overheads	573 91	623.40	0 00	516.04	303.95	0.00	0.00	742.33	0.00	459 94
Excavation	76.97	120.38	0 00	114.73	114.73	0.00	0.00	89.92	0 00	105 75
Substructure	340.55	517.98	0.00	478.51	215.90	0.00	0.00	254 82	0 00	311.16
Fittings	31.87	31 87	0.00	36 84	33.47	0.00	0.00	52.50	0.00	35 71
Superstructure	168.65	357.90	0 00	169.33	223 89	0.00	0.00	169 33	0 00	207 92
OVERALL TOTAL	1,191.94	1,651.53	0.00	1,315.44	891.93	0.00	0.00	1,308.90	0.00	1,120.48
Contractor Delivery Method										
Project Overheads	284 85	623 40	575 61	235.93	264.71	257.99	467.95	226 82	246 16	313 32
Excavation	100.59	162.38	123 79	154 11	154.11	88.76	67.00	117.92	205 48	124.58
Substructure	235.00	356.70	380 54	265 00	325.00	300 00	780.95	275 00	275 00	326 17
Fittings	31.87	39.23	40 62	44 20	40.83	41.13	39.62	57 99	41 13	40 13
Superstructure	168.65	357.90	354.50	169 33	223.89	168.65	339.50	169.33	194 33	210.83
OVERALL TOTAL	820 95	1,539 61	1,475 05	868 57	1,008.53	856.53	1,695.02	847.06	962 10	1,015 03

TABLE E13 STRATEGY OPTION 3 (from 1995 onwards)
SUMMARY OF PERCENTAGE NRSP UNIT PROVISION COSTS h/

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Project Overheads	48 1%	37 7%	0.0%	39 2%	34.1%	0.0%	0 0%	56 7%	0 0%	40 2%
Excavation	6 5%	7.3%	0 0%	8 7%	12.9%	0.0%	0.0%	6.9%	0 0%	9 9%
Substructure	28 6%	31 4%	0 0%	36 4%	24.2%	0.0%	0 0%	19 5%	0 0%	27 2%
Fittings	2.7%	1 9%	0 0%	2.8%	3.8%	0.0%	0.0%	4 0%	0 0%	3.3%
Superstructure	14 1%	21.7%	0 0%	12 9%	25.1%	0.0%	0.0%	12.9%	0 0%	19 4%
OVERALL TOTAL	100.0%	100 0%	0.0%	100.0%	100.0%	0.0%	0.0%	100 0%	0 0%	100 0%
Contractor Delivery Method										
Project Overheads	34.7%	40 5%	39 0%	27.2%	26.2%	30.1%	27 6%	26.8%	25.6%	30 7%
Excavation	12.3%	10 5%	8.4%	17.7%	15.3%	10.4%	4.0%	13.9%	21 4%	13 1%
Substructure	28 6%	23 2%	25 8%	30.5%	32.2%	35.0%	46.1%	32.5%	28 6%	31 5%
Fittings	3.9%	2.5%	2.8%	5.1%	4.0%	4.8%	2.3%	6.8%	4 3%	4 2%
Superstructure	20.5%	23.2%	24.0%	19.5%	22.2%	19.7%	20.0%	20.0%	20.2%	20 6%
OVERALL TOTAL	100.0%	100.0%	100.0%	100 0%	100.0%	100.0%	100.0%	100.0%	100 0%	100.0%

TABLE E14 STRATEGY OPTION 3 (from 1995 onwards)
ANALYSIS OF NRSP UNIT PROVISION COSTS BY TYPE h/
(Pula, 1990 Prices)

Council Delivery Method	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Supervision & Administration	138 79	138.79	0.00	138 79	138.79	0.00	0.00	138 79	68 01	138.79
Labour	369.07	355.93	0.00	477 55	220.87	0.00	0.00	304.32	0 00	312 11
Materials & Equipment	684 08	1,156 81	0 00	646.41	532.27	0.00	0.00	865 78	0 00	560 07
OVERALL TOTAL	1,191 94	1,651.53	0.00	1,262.76	891.93	0.00	0.00	1,308 90	68.01	1,110 98
Contractor Delivery Method										
Supervision & Administration	138.79	138 79	138.79	138 79	138.79	138.79	138.79	138.79	138 79	138.79
Contract Costs	235.00	60.00	100.00	265.00	325.00	300.00	175.00	275.00	275.00	240 74
Other Labour	112.93	184.02	182.13	118.89	124.36	124.90	180.98	111.27	164 40	136.31
Other Materials & Equipment	334.23	1,156.80	1,054.13	345 88	420.37	292.84	1,200.25	322 00	383 91	499 18
OVERALL TOTAL	820.95	1,539.61	1,475.05	868 57	1,008.53	856 53	1,695.02	847.06	962 10	1,015 03

STRATEGY OPTION 3 (from 1995 onwards)

TABLE E15 ANALYSIS OF PERCENTAGE NRSP UNIT PROVISION COSTS BY TYPE h/

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Council Delivery Method										
Supervision & Administration	11 6%	8.4%	0.0%	11 0%	15 6%	0 0%	0.0%	10.6%	0 0%	13 0%
Labour	31 0%	21.6%	0 0%	37 8%	24.8%	0.0%	0.0%	23.3%	0 0%	27.8%
Materials & Equipment	57 4%	70.0%	0.0%	51.2%	59.7%	0.0%	0.0%	66 1%	0.0%	59.2%
OVERALL TOTAL	100.0%	100.0%	0.0%	100 0%	100.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Contractor Delivery Method										
Supervision & Administration	16 9%	9.0%	9.4%	16 0%	13.8%	16.2%	8.2%	16.4%	14 4%	14.5%
Contract Costs	28 6%	3 9%	6 8%	30.5%	32.2%	35 0%	10.3%	32.5%	28 6%	26 2%
Other Labour	13 8%	12 0%	12.3%	13.7%	12.3%	14.6%	10.7%	13.1%	17.1%	13.7%
Other Materials & Equipment	40 7%	75.1%	71.5%	39.8%	41.7%	34.2%	70.8%	38.0%	39 9%	45.5%
OVERALL TOTAL	100 0%	100.0%	100.0%	100.0%	100 0%	100.0%	100.0%	100.0%	100 0%	100 0%

STRATEGY OPTION 3 (from 1995 onwards)

TABLE E16 ANALYSIS OF UNIT NRSP PROVISION COSTS BY BUDGET CATEGORY h/
(Pula, 1990 Prices)

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Council Delivery Method										
Development Expenditures										
Capital Budget	230 49	254 23	0 00	202 04	96 96	0 00	0 00	311 39	0.00	173 84
Recurrent Budget k/	343 42	369 17	0.00	326.49	221.24	0 00	0.00	443.44	68 01	296 29
Householder k/										
Labour/Materials	182 40	365 90	0.00	166.21	219 01	0.00	0.00	171.83	0 00	208 39
Registration Fee	0.00	0.00	0 00	0.00	0.00	0 00	0.00	0 00	0 00	0 00
Reduced Subsidies	435.63	662 23	0.00	568 02	354.72	0.00	0 00	382 24	0 00	432 46
Total	618.03	1,028 13	0.00	734 22	573.73	0.00	0.00	554 07	0 00	640 85
Sub-Total	1,191.94	1,651.53	0.00	1,262.76	891.93	0.00	0.00	1,308 90	0 00	1,110.98
Contractor Delivery Method										
Development Expenditures										
Capital Budget	82 76	254.23	227.85	62.98	77.11	65.17	175.09	56.38	65.17	97.78
Recurrent Budget k/	202 09	369.17	347.76	185 46	201.85	206.82	292.86	182.94	180 99	220 72
Householder k/										
Labour/Materials	182.40	365.90	362.50	166.21	219.01	194 65	358.25	171.83	206 83	222 17
Registration Fee	0 00	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00
Reduced Subsidies	353 70	550.31	536.93	453.93	510.56	389.89	868.81	435.91	509 10	474.35
Total	536 10	916.21	899.43	620.13	729.57	584.54	1,227.06	607.74	715.93	696 52
Sub-Total	820.95	1,539 61	1,475.05	868.57	1,008.53	856.53	1,695.02	847.06	962 10	1,015 03

STRATEGY OPTION 3 (from 1995 onwards)

TABLE E17 ANALYSIS OF PERCENTAGE NRSP PROVISION COSTS BY BUDGET CATEGORY h/

	CDC	GDC i/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC	Weighted Average
Council Delivery Method										
Development Expenditures a/										
Capital Budget	19.3%	15.4%	0.0%	16 0%	10.9%	0.0%	0.0%	23.8%	0.0%	15 0%
Council Recurrent b/	28 8%	22.4%	0.0%	25 9%	24 8%	0.0%	0.0%	33.9%	0.0%	26 5%
Householder b/										
Labour/Materials	15.3%	22 2%	0.0%	13 2%	24.6%	0.0%	0.0%	13.1%	0.0%	19 5%
Registration Fee	0.0%	0.0%	0.0%	0 0%	0.0%	0.0%	0.0%	0.0%	0 0%	0 0%
Reduced Subsidies	36 5%	40 1%	0 0%	45.0%	39 8%	0.0%	0.0%	29 2%	0 0%	38 9%
Sub-Total	51.9%	62 3%	0 0%	58 1%	64.3%	0.0%	0 0%	42 3%	0 0%	58 5%
Total	100.0%	100 0%	0 0%	100 0%	100 0%	0.0%	0.0%	100.0%	0.0%	100 0%
Contractor Delivery Method										
Development Expenditures a/										
Capital Budget	10 1%	16 5%	15 4%	7 3%	7 6%	7.6%	10 3%	6 7%	6 8%	9 2%
Council Recurrent b/	24 6%	24 0%	23 6%	21 4%	20.0%	24.1%	17.3%	21 6%	18 8%	22 1%
Householder b/										
Labour/Materials	22.2%	23 8%	24 6%	19 1%	21 7%	22.7%	21.1%	20 3%	21 5%	21 8%
Registration Fee	0.0%	0 0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 0%	0 0%
Reduced Subsidies	43.1%	35.7%	36 4%	52 3%	50 6%	45.5%	51.3%	51.5%	52 9%	46 7%
Sub-Total	65.3%	59.5%	61 0%	71 4%	72.3%	68 2%	72.4%	71.7%	74 4%	68 7%
Total	100.0%	100.0%	100 0%	100 0%	100.0%	100.0%	100 0%	100 0%	100 0%	100 0%

STRATEGY OPTION 3 (from 1995 onwards)

TABLE E18 ROUGH ESTIMATES OF INCREASES IN UNIT OVERHEADS FOR HEALTH EDUCATION h/
(based on estimates for Kweneng District)

Weighted Average of Existing Supervision & Health Education

	Annual No. Latines	Unit Health Education Costs (P) Supervis.	Materials	Inspectorate
Council Method	650	67 51	30	10.49
Contractor Method	140	70.33	30	10.49
Total	790	68 01	30.00	10 49

Annual District Coverage for Improved Health Education

Campaign Areas KWDC	5
Years to Cover District	8
Av. Annual Proportion	12.5%

Additional Requirements for Time of Family Welfare Educators and Enrolled Nurses

	Average Grade	KWDC	Av. Ann. District Coverag	Staff Tim In Area of Campaig	Equiv. Full-time Staff	Unit Cost	Av.Annual Cost	Per Latrine
Family Welfare Educators	B5	81	12.5%	25%	2.5	4,396	11,127	14 09
Enrolled Nurses	B2	141	12.5%	25%	4.4	8,285	36,506	46 21

Summary of Changes in Unit Overheads for Increased Health Education (P)

Supervision H/Education.	68.01
materials	30 00
inspectorate	10.49
FWEs	14.09
Enrolled Nurses	46.21

STRATEGY OPTION 3 ASSUMPTIONS FOR NRSP ANNUAL COST PROJECTIONS

1) Level of Coverage = 60%
2) GoB Subsidy for Usage of Compressor = 0%
3) GoB Subsidy for Desludging of Latrines N/A
4) GoB Subsidy for Substructure & Fittings = 0%
5) Rate of Inflation = 10%
6) Inflation Linking of Registration Fees FALSE
7) Contingencies = 10%
8) Average Latrine Capacity (8, 12 or 16 Years) N/A

9) Annual Latrine Provision	1990-94	1995-99	2000-04	2005-10	2010-19	All Years 1990-2019
Central District	850	1,733	1,733	1,733	955	39,794
Ghanzi District	100	71	71	71	48	2,048
Kgalagadi District	120	46	46	46	30	1,585
Kgatleng District	453	383	383	383	280	10,800
Kweneng District	790	433	433	433	314	13,590
North East District	300	238	238	238	114	6,217
North West District	200	509	509	509	330	11,938
Southern District	350	392	392	392	249	10,109
South East District	300	225	225	225	187	6,737
Annual Totals	3,463	4,029	4,029	4,029	2,506	102,818

10) Use of Council & Contractor Delivery Methods

	CDC	GDC i/ l/	KGDC	KTDC	KWDC	NEDC	NWDC	SDC	SEDC
Existing									
Council Method	29%	N/A	0%	56%	82%	0%	0%	43%	0%
Contractor Method	71%	N/A	100%	44%	18%	100%	100%	57%	100%
Assumed m/									
Council Method	29%	25%	0%	56%	82%	0%	0%	43%	0%
Contractor Method	71%	75%	100%	44%	18%	100%	100%	57%	100%

11) Rough Additional Costs of Implementing Strategy (Pula'000s)

Workshops etc	150
Latrine Technology R&D	750
H/Education Development	400
Sub-total	1,300

12) Phasing of New Approach

Provision costs for 1990-94 are based on existing approach. From 1995 revised costs of implementation based on health education emphasis are used

TABLE E19 SUMMARY OF COST PROJECTIONS, INCLUSIVE OF CONTINGENCIES h/
(Total Costs for All Years in Pula'000s, 1990 Constant Prices)

STRATEGY OPTION 3

	1990-94	1995-99	2000-04	2005-10	2010-19	All Years 1990-2019
Programme Costs						
Central District	6,620	8,865	8,865	8,865	9,770	42,983
Ghanzi District	1,392	612	612	612	835	4,062
Kgalagadi District	1,619	372	372	372	482	3,217
Kgatleng District	4,362	2,291	2,291	2,291	3,349	14,584
Kweneng District	6,299	2,174	2,174	2,174	3,155	15,976
North East District	2,394	1,123	1,123	1,123	1,076	6,838
North West District	2,655	4,747	4,747	4,747	6,152	23,048
Southern District	3,125	2,250	2,250	2,250	2,858	12,734
South East District	2,659	1,189	1,189	1,189	1,975	8,201
Sub-total	31,124	23,622	23,622	23,622	29,652	131,644
Costs of Implementing Strategy	1,300	0	0	0	0	1,300
TOTAL	32,424	23,622	23,622	23,622	29,652	132,944
Funding of Programme Costs						
Capital Budgets	15,306	2,891	2,891	2,891	3,596	27,575
Council Recurrent Budgets	8,558	5,905	6,033	6,113	7,686	34,295
Householder Contributions	8,560	14,826	14,698	14,618	18,371	71,074
TOTAL	32,424	23,622	23,622	23,622	29,652	132,944
Latrine Desludging Costs						
Council Recurrent Budgets	0	0	0	0	0	0
Householder Contributions	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0
OVERALL COSTS	32,424	23,622	23,622	23,622	29,652	132,944

TABLE E20

STRATEGY OPTION 3

NRSP ANNUAL COST PROJECTIONS IN 1990 CONSTANT PRICES h/
(INCLUSIVE OF CONTINGENCIES)

(Annual Costs in Pula'000s, 1990 Constant Prices)

	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Average Price Index, 1990 = 1 00	1.22	1 97	3 17	5 10	10.72	4 44
Central District						
Capital Budgets	606 1	240 6	240.6	240 6	132 6	7,964 9
Council Recurrent Budgets	353.8	492 6	503 6	510.4	284.5	12,147 4
Householder Contributions	364 1	1,039 8	1,028 7	1,021.9	559 9	22,871.2
Annual Totals	1,323 9	1,772 9	1,772 9	1,772.9	977.0	42,983 4
All Years Totals	6,619 7	8,864 5	8,864 5	8,864 5	9,770.2	42,983 4
Ghanzi District						
Capital Budgets	126 6	19 8	19 8	19 8	13 5	1,066 1
Council Recurrent Budgets	68 6	30 0	30 4	30 7	21 1	1,009 3
Householder Contributions	83 2	72 6	72.1	71.8	48 8	1,986 6
Annual Totals	278 4	122 4	122 4	122 4	83 5	4,062 0
All Years Totals	1,391 9	611 8	611 8	611 8	834 6	4,062 0
Kgalagadi District						
Capital Budgets	156.7	11 5	11 5	11 5	7 5	1,030 5
Council Recurrent Budgets	68 0	18.3	18.6	18.8	12.3	740.9
Householder Contributions	98 9	44.6	44 3	44 1	28.5	1,445.4
Annual Totals	323 7	74 4	74.4	74 4	48 2	3,216 8
All Years Totals	1,618 5	371.9	371.9	371.9	482.5	3,216.8
Kgatleng District						
Capital Budgets	345 2	59 2	59.2	59.2	43.3	3,046 5
Council Recurrent Budgets	349 4	117 4	119 8	121.3	89 7	4,436 1
Householder Contributions	177 9	281.6	279 1	277.6	202.0	7,101 1
Annual Totals	872 5	458 1	458 1	458 1	334 9	14,583 7
All Years Totals	4,362 3	2,290 7	2,290 7	2,290 7	3,349 3	14,583 7
Kweneng District						
Capital Budgets	445 0	44 5	44 5	44.5	32.3	3,216 0
Council Recurrent Budgets	412 8	110 8	113 5	115 3	84 7	4,609 0
Householder Contributions	402 0	279 5	276 7	275 0	198 5	8,150 8
Annual Totals	1,259 8	434 8	434 8	434.8	315 5	15,975 9
All Years Totals	6,299 1	2,173 9	2,173 9	2,173 9	3,155 0	15,975.9
North East District						
Capital Budgets	260 2	17 1	17.1	17 1	8.2	1,639 4
Council Recurrent Budgets	82 0	58 1	59 6	60.5	29.4	1,595 1
Householder Contributions	136 6	149.4	147 9	146 9	70.0	3,604 0
Annual Totals	478 8	224 5	224 5	224 5	107 6	6,838.5
All Years Totals	2,394.0	1,122 7	1,122.7	1,122 7	1,076 5	6,838 5
North West District						
Capital Budgets	281 1	98.1	98.1	98.1	63.5	3,512.2
Council Recurrent Budgets	86 7	172.3	175.5	177.6	116.2	4,222.4
Householder Contributions	163.0	679.1	675 8	673.8	435.5	15,313.5
Annual Totals	530 9	949.4	949.4	949 4	615.2	23,048 1
All Years Totals	2,654.5	4,747.2	4,747.2	4,747.2	6,152 0	23,048.1
Southern District						
Capital Budgets	297.5	71 4	71.4	71.4	45.3	3,011.1
Council Recurrent Budgets	185 7	133.2	135 7	137 3	88.0	3,839 8
Householder Contributions	141 8	245 5	243.0	241.5	152.5	5,883 3
Annual Totals	625 1	450 1	450.1	450 1	285 8	12,734 2
All Years Totals	3,125.3	2,250.4	2,250 4	2,250.4	2,857.6	12,734.2
South East District						
Capital Budgets	282 6	16.1	16.1	16.1	13.4	1,788 3
Council Recurrent Budgets	104 6	48 4	49.8	50 7	42.7	1,694 8
Householder Contributions	144 6	173 4	171.9	171 0	141.4	4,718.4
Annual Totals	531.8	237 9	237.9	237 9	197.5	8,201.5
All Years Totals	2,658 8	1,189.3	1,189.3	1,189.3	1,974.8	8,201.5
Costs of Implementing the Strategy	260 0	0	0	0	0	1,300 0
ALL DISTRICTS						
Capital Budgets	3,061.1	578.2	578.2	578.2	359.6	27,575.0
Council Recurrent Budgets	1,711.6	1,181.0	1,206 6	1,222.6	768.6	34,294.7
Householder Contributions	1,712.1	2,965.2	2,939 6	2,923.7	1,837.1	71,074 3
OVERALL ANNUAL TOTALS	6,484.8	4,724.5	4,724.5	4,724.5	2,965.2	132,944 0
OVERALL ALL YEARS TOTALS	32,424.1	23,622.5	23,622.5	23,622.5	29,652.5	132,944 0

TABLE E21 NRSP ANNUAL COST PROJECTIONS IN CURRENT PRICES h/
(INCLUSIVE OF CONTINGENCIES)

STRATEGY OPTION 3

(Annual Costs in Pula'000s, Current Prices)

	1990-94	1995-99	2000-04	2005-9	2010-19	All Years 1990-2019
Average Price Index, 1990 = 1 00	1.22	1.97	3.17	5.10	10 72	4.44
Central District						
Capital Budgets	740.0	473.1	761.9	1,227.1	1,421.5	30,225.8
Council Recurrent Budgets	432 0	968.6	1,594.9	2,603 5	3,050 7	58,502.4
Householder Contributions	444.5	2,044.6	3,258.0	5,212.1	6,003.2	114,828.8
Annual Totals	1,616 6	3,486 4	5,614 8	9,042.7	10,475.5	203,557.0
All Years Totals	8,082.8	17,431.8	28,074.0	45,213.5	104,754.9	203,557.0
Ghanzi District						
Capital Budgets	154 6	39 0	62 8	101.2	145 1	3,239 7
Council Recurrent Budgets	83.7	58 9	96 3	156 6	226.3	4,240.6
Householder Contributions	101.6	142.7	228 3	366 3	523 5	9,429 2
Annual Totals	339 9	240.6	387 5	624 1	894 9	16,909 6
All Years Totals	1,699 6	1,203.1	1,937.7	3,120 6	8,948.7	16,909 6
Kgalagadi District						
Capital Budgets	191 4	22 6	36 4	58 6	79.9	2,343 8
Council Recurrent Budgets	83 1	35 9	58 8	95 6	131 5	2,682.6
Householder Contributions	120 8	87 7	140 4	225 1	305 9	5,929 3
Annual Totals	395.2	146.3	235.6	379.4	517 3	10,955 7
All Years Totals	1,976 2	731.4	1,177.8	1,896 9	5,173.3	10,955.7
Kgatleng District						
Capital Budgets	421.5	116 4	187.4	301 9	463.9	9,775 0
Council Recurrent Budgets	426 6	230.9	379 5	618.9	961.2	17,891 5
Householder Contributions	217 2	553.7	884 0	1,416 0	2,165.9	37,013 5
Annual Totals	1,065.3	900.9	1,451.0	2,336.8	3,591.0	64,680 0
All Years Totals	5,326 4	4,504.6	7,254.8	11,683.9	35,910.4	64,680.0
Kweneng District						
Capital Budgets	543 4	87.5	141.0	227.1	346.4	8,458 9
Council Recurrent Budgets	504 0	217.9	359 6	587 9	908.2	17,428 7
Householder Contributions	490 8	549.6	876 4	1,402 7	2,128 2	37,879 6
Annual Totals	1,538 3	855.0	1,377.0	2,217 6	3,382.8	63,767 1
All Years Totals	7,691 4	4,274.9	6,884 8	11,088 0	33,828 1	63,767 1
North East District						
Capital Budgets	317 8	33 6	54.1	87 1	87.8	3,341 3
Council Recurrent Budgets	100.1	114.2	188 7	308 8	315.3	6,712.7
Householder Contributions	166.8	293.7	468.3	749.3	751.0	15,900.5
Annual Totals	584.6	441.5	711.1	1,145 2	1,154 2	25,954.5
All Years Totals	2,923 1	2,207.7	3,555.5	5,726 2	11,541.9	25,954.5
North West District						
Capital Budgets	343 3	192.9	310 6	500 2	681.4	13,548.3
Council Recurrent Budgets	105.9	338.8	555 9	905.6	1,245 5	21,986.7
Householder Contributions	199 1	1,335 4	2,140.3	3,436.8	4,669 2	82,249 7
Annual Totals	648 2	1,867 0	3,006.9	4,842 6	6,596 1	117,784.7
All Years Totals	3,241.2	9,335.2	15,034.5	24,213.1	65,960 6	117,784.7
Southern District						
Capital Budgets	363.3	140.3	226 0	363.9	485 7	10,325.1
Council Recurrent Budgets	226.8	262.0	429 8	700 1	943 5	17,528.6
Householder Contributions	173.1	482 8	769.6	1,231.6	1,634.7	29,632.2
Annual Totals	763 2	885 1	1,425 4	2,295.7	3,063 9	57,485 9
All Years Totals	3,816 0	4,425.4	7,127.1	11,478.3	30,639 1	57,485.9
South East District						
Capital Budgets	345 0	31.7	51.0	82.2	143 4	3,984 0
Council Recurrent Budgets	127.7	95.2	157.8	258.6	458.2	7,778.3
Householder Contributions	176.6	340.9	544.5	872 4	1,515 8	24,829.3
Annual Totals	649 3	467.7	753.3	1,213.2	2,117.4	36,591.6
All Years Totals	3,246 4	2,338.7	3,766 5	6,066.0	21,173.9	36,591.6
Costs of Implementing the Strategy	317 5	0.0	0.0	0.0	0.0	1587.3
ALL DISTRICTS						
Capital Budgets	3,737 7	1,137.1	1,831.3	2,949.3	3,855.2	86,829.2
Council Recurrent Budgets	2,089 9	2,322.4	3,821.4	6,235.6	8,240 5	154,752.0
Householder Contributions	2,090.5	5,831.0	9,309.8	14,912.3	19,697 4	357,692.2
OVERALL ANNUAL TOTALS	7,918.1	9,290 6	14,962.5	24,097.3	31,793 1	599,273.4
OVERALL ALL YEARS TOTALS	39,590.5	46,452.8	74,812.7	120,486.6	317,930.8	599,273.4

FOOTNOTES

a/ Excluding Gaborone, Francistown, Lobatse, Selebi-Phikwe, Jwaneng, Mogoditshane and Orapa

b/ Other settlements with 1990 population in excess of 500 people.

c/ Number of households is rough estimate.

d/ Estimates for 1990 based on NWMP population projections and estimated overall average persons per household using MLGL data.

e/ Assuming constant number of persons per household

f/ Assuming that the percentage of new households which will provide their own toilet facilities independently of NRSP will equal the percentage of households in 1990 having toilet facilities

g/ Assuming from 1990 to 1994 implementation will continue at existing scale; from 1995 to 2009 annual implementation rates will be revised to achieve the target level of coverage by 2010, and, from 2010 onwards implementation rates will be matched to the number of new households without toilets.

h/ Calculations as displayed include minor errors due to rounding of decimals.

i/ The following notations have been used to identify funding source: (D) development funds provided from MLGL budgets, (R) funds provided from council recurrent budgets, (H) costs met by households

j/ GDC's overall annual target for all delivery methods is 100 latrines. At the time of preparing the current it was not clear which delivery method GDC would adopt.

k/ Assuming P 30 Registration Fee is treated as Council Recurrent Revenue

l/ Assuming for costing purposes that GDC will provide most latrines through the labour-only contractor method which is estimated to be the least-cost approach, but that the council delivery method will still be required for some more remote locations where contractors may not be available

m/ In cases other than the base case, assuming that councils may revise their choice of delivery methods on the basis of least costs.