

SELF HELP ENVIRONMENTAL SANITATION PROJECT

END OF PROJECT EVALUATION REPORT

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GOVERNMENT OF BOTSWANA

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1. ACKNOWLEDGEMENTS

This end of project evaluation marks the end of UNICEF funding to this phase of the Self-Help Environmental Sanitation Project. The purpose of the evaluation is to provide a broad review of the project in the light of anticipated future expansion to a national programme.

The evaluation mission was carried out between 19 July and 5 August, 1988 by Dr. Anthony M. Land of the Government of Botswana, Robert W. Larsson of UNICEF and Mrs. Sarah Murray Bradley of the World Bank. The evaluation methodology consisted of three parts; a literature review, field trips and interviews.

The literature review covered relevant reports and documents from the files and a selected bibliography appears in Annex 6. Interviews were carried out in Gaborone and in the field and a list of people met appears as Annex 4.

The field trips were arranged in order to visit at least one village included in the project in each of the four districts, to visit at least two villages included in the ESPP pilot project and to visit at least two villages not included in any sanitation project. In this last category, we were particularly interested to visit a village called Manyana, reputed to have a high latrine coverage with no project intervention so that we could investigate motivation. We also visited two district council offices and interviewed relevant officers and councillors about the project. A map showing the villages visited appears as Annex 5.

At the villages, we inspected latrines in the various stages of construction and interviewed workmen, project coordinators and householders. In each category of village, we interviewed members of the households with a project latrine, without a project latrine and with privately constructed latrines. It was difficult in project villages to find households with neither latrines nor the commitment to build them.

During the evaluation mission, the evaluators were guided by members of the reference group.

The evaluation report is arranged in four major sections. The first sets a description of the project within a socio-economic and sector setting in Botswana. The second looks at the international sector setting. The third is an analysis of the project topic by topic and the fourth is a broader view of the relationship between this and other projects in the sector in the light of the plans for national expansion put forward in the 'Project Addendum'. Within this are incorporated comments on the Project Addendum.

The authors wish to thank the following for their support and contribution to the preparation of this evaluation report:

- To members of the Government of Botswana, representatives of UNICEF and the World Bank/UNDP for coordinating this evaluation and for providing financial and logistical support.
- To members of the reference group for monitoring and reviewing the progress of the evaluation.
- To all individuals in the communities, the districts and Gaborone who were interviewed and provided the team with invaluable information and insights.
- To all those who commented on the draft report, thus allowing the final report to be completed.

2. EXECUTIVE SUMMARY

The Self-Help Environmental Sanitation Project (SHESP) has been a successful project that clearly demonstrates the value of the self-help approach. It has developed and proven construction and social mobilisation delivery systems and has successfully promoted useful adaptations of Ventilated Improved Pit Latrines. Unfortunately, the accomplishments of the SHESP project have not been adequately promoted either nationally or internationally.

This evaluation by a team representing UNICEF, the World Bank and the Government of Botswana marks the end of the UNICEF noted project (supplementary funding by the Netherlands). The evaluators were guided in their efforts by a reference group of the core members of the Botswana project, Ministry of Local Government and Lands (MLGL), Ministry of Health, Ministry of Finance and Development Planning, District Councils, UNICEF and the Senior Public Health Engineer Advisor who is funded by the World Bank/UNDP.

Botswana is a land-locked country of 1.2 million people in southern Africa with a per capita income of 920 US\$. Much of the economic impetus comes from diamonds and cattle. The GNP has multiplied 5 times since independence in 1966 but there have been several periods of drought. The stable Government pursues a policy of rural development with redistribution of income earned in the mining sector. This has resulted in an impressive infrastructure of schools, health centres, and water supply in both semi-urban and rural areas. The infant mortality rate is 72 per thousand while the under five mortality rate is 103 per thousand.

The World Bank has financed the post of Senior Public Health Engineer in the MLGL from 1980 until 1988 when his Motswana counterpart took over the post. The Senior Public Health Engineer is responsible for sanitation in Botswana, which has made great strides especially in self-help Site and Service schemes.

The Self-Help Environmental Sanitation Project (SHESP) grew out

of earlier efforts in sanitation in Botswana especially the USAID-funded ESSP project which served as the pilot phase.

The major goals of SHESP were to improve and popularise the Botswana Improved Pit Latrine as well as develop and prove replicable delivery systems for mobilisation, sanitation education and construction of latrines.

The project has demonstrated a methodology of motivating rural householders to participate both physically and financially in the construction of family latrines. Over 3,500 households would, could and did pay an average of 220 Pula (110 US\$) each for latrines. This far exceeds any theoretical estimation of the ability or willingness to pay.

The SHESP project had many positive features but three faults: lack of a clear methodology led to a serious under-appreciation of the achievements; different financial administrative procedures were unreconciled leading to needless complications; the project lasted four years instead of the overly optimistic two years planned.

The consensus building and mobilisation activities were slow in coming to fruition with 500 participants enrolling in the first two years and 2,500 enrolling in the last two years. However household participation was effective in the long term with approximately 90% of the households completing the superstructure within three months.

Sanitation education was fully integrated in and depended on the Primary Health Care and Family Welfare Education Systems that are well developed on the local level. The success of the project must in large part be attributed to its integration with the established and well functioning primary health care delivery system.

Effective delivery was constrained by a shortage of suitable manpower at all levels. Administratively, training funds did not come from the project per se but were nevertheless available to assure significant formal and on-the-job training. A more structured training programme would allow more efficient use of available manpower. A

national programme requires a project manager for sanitation, added personnel support for the water hygiene programme, more district health inspectors and additional district and village sanitation coordinators.

The Botswana Improved Pit Latrine is easy to construct, durable, odourless and relatively easy to clean. Because the household constructs the superstructure the visible part is compatible with the home. The ground in Botswana is mostly either soft sand or hard rock. In sand, pit lining is required to prevent collapse while in hard rock, mechanical assistance from a jackhammer is required to dig. Both of these conditions cause the price of a latrine to rise.

The average construction costs per latrine were P558 in unconsolidated ground and P491 in consolidated ground. The household contributed 42%, UNICEF 37% and the districts 21% of these costs. Over 40% of project costs (UNICEF and districts) was for transport. Future cost savings would come primarily from a more efficient organisation of transport.

The household was responsible for enrolling in the programme, paying a P30 registration fee and digging the pit according to specifications. After verification of the household tasks by the village sanitation coordinator, the project team would build the substructure consisting of building a block lining of the pit and installing slabs and the seat insert. Then the householder would build the superstructure and the team would return and install the vent pipe. In one district, doors were given as an incentive to complete the superstructure within three months.

Villagers could dig the pit and construct the superstructures themselves but in practice they usually hired a local builder at an average P120 in labour for digging the pit and building the superstructure. The materials for the superstructure cost an average P90. The P30 registration fee was originally supposed to cover the costs of the slabs, vent pipe, fly screen and seat liner in a cost recovery system. However, this idea was quickly lost to insuring quality by subsidies.

Although there were some difficulties of quality control in procurement and construction, on the whole quality of latrines is high.

Plans of operations, overly optimistic at the start, became more realistic during the project as the staff gained experience in preparing plans of action. Another weakness of planning was that the various components of the programme were split up between projects and ministries with UNICEF funding mainly the construction sector. This led to the unfortunate assumption reflected in progress reports that UNICEF interest and intervention would be limited to construction. This evaluation shows that although inadequately reported, the necessary software issues were addressed.

Analysis of the costs of the complete rural sanitation programme shows that 38% was spent on construction, 23% on supervision and planning, 22% on logistical support, 8% on mobilisation and health education, 6.5% on manpower training and 2.5% on research and demonstration. UNICEF inputs went mainly for construction and logistical support. UNDP/WORLD BANK inputs went to supervisory personnel and training. The Government of Botswana supported all sectors although expenses were divided into several different budgets.

This project has clearly demonstrated the feasibility and methodology of complete rural sanitation coverage within a reasonable time frame. With attention paid to the objectives (promoting latrines) instead of concentrating solely on targets (building latrines), this programme is replicable on a national scale. Latrines are sustainable in that people build and maintain them. The technology of these latrines is appropriate as they are hygienic, odourless, people like them and they do not fall down. Although these latrines are expensive (P550), they seem to be affordable in that households are willing and able to pay P250. With the level of subsidisation per household for rural water provision at approximately P2,000 a level of subsidisations of P300 for sanitation seems feasible.

The project addendum as it stands has proved useful in demonstrating national commitment to rural sanitation and serving as a

basis for funding. It must be substantially ammended especially in the areas of self-help, local participation, decentralisation, mobilisation and integration of hardware and software if it is to serve as an effective national project document.

Equipment and supplies remaining at the end of this project should go to the local districts to be used in continuing sanitation activities. Future cost analysis should consider these inputs in evaluating the price of the programme.

In so far as current UNICEF and World Bank support expires before the end of 1988 it would be useful to identify areas or components that might benefit from their further support. There are economic and socio-cultural studies that would be beneficial in clarifying the effects and results of this project.

The commitment of the Government and People of Botswana to effective rural sanitation as demonstrated in this project is encouraging and the evaluation teams hopes they will continue the good work.

3. RECOMMENDATIONS

3.1 Planning

- 3.1.1 The project addendum should be rewritten in the light of lessons learnt in this project, with greater emphasis placed on social mobilisation and health education issues.
- 3.1.2 Government needs to formally write a sanitation sector plan. In this respect, an interdisciplinary district sanitation sector committee should be created to support preparation of such a plan.
- 3.1.3 Council public health departments need to prepare three year rolling plans for the project, consistent with DDP and NDP planning procedures.
- 3.1.4 Annual plans of action need to address software as well as hardware issues. Programming of social mobilisation and health education activities is especially required.
- 3.1.5 Annual planning should be used to assist better estimation of supply needs so that procurement arrangements may take advantage of bulk purchasing.
- 3.1.6 In order to ensure the long-term replication and sustainability of the project, at least one full year of project activity should focus on social mobilisation, before any major construction work commences.
- 3.1.7 Monitoring of both the software and the hardware aspects of the project should be standardised in order that it can be used as a management tool at national and district levels. It should also be action orientated so that it will be relevant to those responsible for data collection and interpretation.

- 3.1.8 Minimum manpower requirements to support a national programme are as follows:
- a) national coordinator (as an established post)
 - b) district sanitation coordinators (as established posts)
 - c) village sanitation coordinators
- 3.1.9 Manpower training to be planned in relation to the needs of an expanding national programme. Used should be made of national institutional capacity wherever possible to support managerial and technical training.
- 3.1.10 Capital equipment remaining from this phase of the project should continue to be used in the next phase.
- 3.2 Research and Development
- 3.2.1 The results of the recommended studies are highly pertinent to the smooth running of the national sanitation project. It is therefore urgent that they are completed as soon as possible and in any case within the next 12 months.
- 3.2.2 Terms of Reference to be prepared for a comprehensive cost analysis study to cover relative construction costs of single and double vault latrines, transport logistics and rural credit facilities.
- 3.2.3 Government of Botswana should commission a sanitation sector strategy policy to provide guidelines for the implementation of future projects.
- 3.2.4 Further research into possible ways of making cheaper sub- and superstructures should be encouraged.
- 3.2.5 A major socio-cultural study should be commissioned in order to investigate the impact of the project on disease morbidity patterns and community knowledge, attitudes and practices towards water and sanitation related diseases.

3.3 Software

- 3.3.1 More emphasis should be placed on targetting schools (especially primary), for health education. Efforts should address the possibility of using both curricular and extra-curricular activities.
- 3.3.2 MLGL and the implementing districts should provide support to the on-going and successful Water Hygiene Education Programme and lobby for additional manpower in this field, as a major part of health education delivery.
- 3.3.3 An integrated but project specific package of technical and health education materials should be developed to service all levels of the programme. This should include adequate standardised monitoring of software outputs.
- 3.3.4 MLGL and districts should make use of all available organisations including MLGL's emergent in-house capacity to support materials production.

3.4. Technology

- 3.4.1 Seat inserts, flyscreens, ventpipes and slabs should be made commercially available while VIP latrine designs should also be made available to the public.
- 3.4.2 Detailed quality control procedures for construction work and procurement need to be developed and institutionalised at the district level.
- 3.4.3 A levy, designed to ensure equity and cost recovery of compressor use should be set up as a standard procedure.
- 3.4.4 Demonstration latrines should be used to demonstrate alternative superstructure designs.

4. BACKGROUND INFORMATION

4.1 Development Approach in Botswana

Since independence, Botswana has pursued a growth with redistribution development policy. Emphasis has been on internal revenue generation through the exploitation of natural resources, especially diamonds and cattle. During the 1970s and 1980s these two sectors have served as growth poles providing revenue and momentum to the rest of the economy. As a result, between 1966 and 1983, GDP/capita increased five hundred percent. These revenues have in part been used to provide basic services to rural settlements.

During the 1970s and early 1980s rural development focussed on the provision of social infrastructure, on production-related activities and on institution building. With the assistance of various donors, government has built up a substantial network of schools, water supplies and health facilities throughout the rural sector while supporting the development of decentralized local authorities with statutory responsibilities for the provision, operation and maintenance of basic services. More recently, priority has been given to projects which can stimulate investment, employment and income generation. Subsidized infrastructure provision remains a major component of rural development. A drought relief assistance programme has been developed which has directly benefitted over 60% of the country's population. This programme includes community based Labour-Intensive Drought Relief Projects.

4.2 Statistical Indicators

Complete statistical indicators are to be found in Appendix 1. Among the more significant indicators are:

Infant Mortality Rate:	72 per 1000 live births
Under Five Mortality Rate:	103 per 1000 live births
GNP per capita:	920 US \$
Population 0-15 years:	543,000
Principal source of household water:	village standpipe(46% of pop)
Avg cost for rural water supply:	500 US \$ per household
Principal means of excreta disposal:	communal bush (84% of pop)

4.3. The International Context

4.3.1 The International Drinking Water Supply and Sanitation Decade.

The International Drinking Water Supply and Sanitation Decade (IDWSSD) began in 1980 with the commitment of most nations of the world to safe water and sanitation for all by 1990. Many human, financial and institutional resources have been mobilised, both in the developing world and the developed countries. UNDP was appointed a coordinating role for directing inputs in this sector. Many international organisations such as UNICEF, the World Bank and WHO, bilaterals and NGOs such as SIDA, NORAD and USAID support the sector globally. Although great progress has been made, especially in water supply and in health education, it is clear that the goals of universal access to safe water and sanitation will not be met by 1990. At an international consultation of all the major bilateral and multi-lateral external support agencies active in water and sanitation, a consensus grew for extending the momentum of the Water and Sanitation Decade beyond 1990. Although there have been many successes in water supply, the global accomplishments in sanitation has been less impressive.

The important strategy considerations identified during the decade are:

1. Consensus building among government and donor agencies to fully support the objectives of the decade.
2. Local and community participation including the role of women in all phases of programmes from planning to implementation.
3. Development of applicable and affordable technology that will not require continual external support.
4. Integration of water supply, sanitation and hygiene education so that they reinforce each other at the household level.

The Self-Help Environmental Sanitation Project has addressed these considerations with interesting approaches. Globally this project seems to be one of the more notable although less noted successes in sanitation and can serve not only for further activities in Botswana but also as an example for successful sanitation worldwide.

4.4. Donor Assistance in Sanitation in Botswana

The sanitation sector has received assistance from a number of donors whose support has been directed to specific projects, research and development, manpower training, sector development and technical staff.

The development and implementation of on-site sanitation projects in urban and rural sectors has been supported by CIDA, IDRC, KFW, SIDA, UNICEF, UNDP/WB. Research and development on sludge removal technology has been sponsored by the IRCWD, ODA and SIDA.

Participation in workshops, conferences and training courses overseas has been supported by funds from UNDP, The World Bank, SIDA and ODA. IVS(UK) and UNDP/UNV have provided six volunteers to support sector activities at the national and district levels. UNDP/WB (TAG) has since 1980 supported sectoral development by appointing and funding the post of Senior Public Health Engineer (SPHE), MLGL.

4.5. On Site Sanitation Sector Policy in Botswana

There was and is no formal written Sector Policy for Sanitation in Botswana. This is generally perceived as a weakness but actually may have been a major strength. Instead of a prior fixed countrywide policy and procedures there is a firm commitment, stated in the National Development Plan, that sanitation for improved health is a priority of government.

In line with the government's policy of decentralization and principles of community participation, the sector is developed and planned locally. The activity of the village development and health committees are coordinated, assisted and supported by the district councils who in turn are assisted and supported by the central ministries, in particular by MLGL. Thus the current policy and procedures are developed in bits and pieces by the people and local authorities based on what actually works best.

The activities of this ad hoc policy have been developed during this and related projects. However, there is still the need to

systematiserural sanitation guidelines. These can then be modified or accepted by local authorities attempting to replicate the experiences of the project. The central government's responsibilities of needs assessment, manpower and financial support, interministerial coordination, technical research and development, legislation, financial and implementational monitoring and evaluation, can only be planned and systematically implemented with a formally written long term sector policy.

4.6. Project Development and Background

The history of SHESP can be traced back to the urban-based Low-Cost Sanitation Research Project, funded through the IDRC in 1976. This initial project developed a double vault ventilated improved pit latrine appropriate for urban conditions. The technology was adapted for replication in urban site and service schemes which provide plots with latrine substructures. Lease conditions and a certificate of rights require the plot holder to complete the latrine superstructure before beginning house construction. A building material loan is available. A service charge is levied to support costs of services provided.

In 1980 the World Bank began the funding for the post of senior public health engineer in the MLGL in Botswana. This post and the unit developed from it have focussed activities in sanitation in the country.

The need to address the increasing spread of excreta-related diseases, in particular, diarrhoeal diseases and hookworm, was stated in 1976 during the National District Development Committees Conference. This was significant; although latrines were not new to rural Botswana, formal government or institutional support to rural household sanitation provision did not exist, indeed, the proportion of households with acceptable sanitation was very low.

The Environmental Sanitation Protection Project (ESPP) was established in collaboration with UNICEF but actually was developed by USAID. The project was influenced by developments both in the urban sector in Botswana and in low-cost sanitation technology developed

elsewhere with the technology advisory group of the World Bank as part of the International Drinking Water Supply and Sanitation Decade (IDWSSD), particularly those developments in Zimbabwe. ESPP was designed to serve both as a research project and as a demonstration project.

ESPP set out to achieve three major objectives; first, a communication support component with the aim of developing, testing and evaluating various educational techniques and messages related to sanitation including the building and maintenance of latrines; second, a construction component aimed at testing various types of latrines and refuse disposal systems, third, the project agreed to identify delivery systems in which ESPP could be replicated.

The project was implemented between 1981 and 1982 in six villages in Southern and Kgatleng districts. The first year of project efforts focussed on the organisation of the project team and on community mobilisation. During this period, health education materials were developed and used. A refuse disposal campaign was successfully conducted. During the second year, the project concentrated on household latrine construction. Emphasis was placed on delivering the necessary goods and services, and on developing capabilities within the districts and villages to enable replication.

The ESPP "blue-print" was presented in the form of two manuals covering both technical and implementation strategy issues. In theory these manuals outline a replicable plan of implementation. In practice they were not tested and only 49 of the 400 planned latrines were completed.

Although the ESPP project only completely achieved the first of its three objectives, it was considered sufficiently successful to warrant further investment in the development of rural sanitation. In particular, the district councils during the 1982 National District Development Conference expressed their wish to see the programme expanded. The experience of ESPP, and the recommendations made in project evaluations formed the basis for the next phase of the rural sanitation programme, SHESP. This project began in early 1984 following the signing of a Plan of Operations between the Government of Botswana and UNICEF.

5. THE SELF-HELP ENVIRONMENTAL SANITATION PROJECT

The plan of operations defined the project in general terms as both a latrine construction project and as a social mobilisation and health education project, the delivery systems of which would be based upon the experience and recommendations of ESPP. The plan of operations targetted the project on a selection of rural villages located in Southern, Kgatleng and Kweneng districts which had expressed strong interest in participating in a rural sanitation project. In 1984, a revised plan of operations was prepared to include Central District and extend the project until 1986. When activities were not completed by 1986 the project was further extended to 1988.

Between 1984 and 1988, SHESP has built on the experience of ESPP in three major areas:

1. Development of socially acceptable, affordable and technically appropriate latrines.
2. Development of a replicable construction delivery system.
3. Development of mobilisation/health education delivery systems.

Achievements in these areas have progressed unevenly, although in totality, a coherent programme has developed. This progress was made possible through the extension of the project to December 1988, after an evaluation report (Nyamwaya, 1986) concluded that the objectives could not be reached within a two or three year period. Support from other related activities and other assistance to the sanitation sector also contributed to the success of the project.

5.1 Construction Delivery System

The basic BOTVIP latrine module developed under ESPP has been modified and further refined. Variations exist among implementing districts. In general, however, attempts have been made to standardise designs and materials used in the substructures and accessories.

Pits are rectangular and 2.5 metres in depth. Pits are constructed either with ring beams in stable soil, or are lined with hollow cement blocks where soil conditions are unstable. Three reinforced concrete cover slabs complete the substructure. One slab is removable.

The original hessian ventpipe has been replaced first by PVC and then by pitch-fibre pipes. These are 3 metres in length with a 100mm interior diameter. Glass-fibre fly-screens have been replaced by stainless-steel mesh screens. The original fibre-glass seat liner is still used although a polyurethane version is also widely available. In some instances, seat covers are provided.

Although superstructures are built by the householder without a standard design, there are common features. The off-set structure is rectangular, fitted with a door and often with a privacy wall. The rectangular spiral design developed under the pilot phase has never been very popular. Walls are constructed with cement blocks or stock bricks, or less commonly mud bricks or corrugated iron sheeting. Corrugated iron is used for roofing. Either standard or home-made doors are used.

Revised designs have been recently prepared and are being field-tested in related sanitation projects. A circular pit lined with trapezoidal bricks has been developed for use in sandy conditions. A more compact superstructure has been designed which makes better use of the cover slabs as a foundation base.

Fundamentally, the project has been a directed, subsidised and decentralized self-help latrine construction project. In general it has been organised as outlined in the 'District Sanitation Coordinators Handbook.'

Central Government:

The Ministry of Local Government and Lands (MLGL) through the office of the Senior Public Health Engineer (SPHE) has been responsible for the overall supervision and coordination of project implementation. The post of SPHE, formerly filled by an expatriate supported by World Bank has during the life of the project been indiginised. The ministry provides technical and administrative support to the implementing districts while supporting research and development within the wider context of the sanitation sector.

Local Government (District Councils):

The core project team operates from the Public Health Department and is responsible to the District Council Health Inspector. The key officer is the District Sanitation Coordinator (DSC), responsible for the supervision and coordination of all construction, mobilisation and health education activities at the field level. The posts have not yet been established as permanent. In some instances, these posts had been held by expatriate volunteers. They have now been fully localised.

Within Council headquarters, the DSC is the only officer working full time on the project. He is expected to obtain the cooperation of other officers attached to relevant departments such as health, water and social and community development.

The key officer at the village level is the Village Sanitation Coordinator (VSC), who is accountable to the DSC. The VSC coordinates all project activity in the village, but especially construction work. This entails the supervision of construction teams and the control of supplies. The VSC is also responsible for mobilisation and health education promotion through liaison with village-based extension workers, village health and development committees and tribal authorities. The VSC is normally a villager with proven experience in construction, health or community-based projects and is recruited with the assistance of village-based institutions on a temporary contract basis.

Construction teams consist of builders and labourers who cast the slabs and construct the substructures. They are employed on a temporary contract basis. Additionally, the council provides drivers for project vehicles and operators for the compressors. In two instances, the councils have also purchased vehicles for use in the project from district funds. Each district has been provided with a supervision pick-up vehicle, at least one flatback truck, and a compressor with jackhammers. Storage sheds are provided both at the council stores and at the village level.

The district councils are required to set aside funds in their recurrent costs budget for wages, operation and maintenance. MLGL, with the assistance of UNICEF has provided funds to support capital costs of plant, tools, equipment, accessories and building materials for the substructure.

Typically, the construction of a project latrine proceeds as follows:

A household wanting to participate in the project, enrolls with the VSC and pays a registration fee of Pula 30, which is deposited with the district council. In some districts, this fee may be paid in installments.

The household then excavates the latrine pit to specified dimensions. In cases where unpickable rock is encountered, the project team assists the household by digging with a jackhammer. No charge is levied at the present time for this service.

The council, through its project staff, constructs the latrine substructure which includes building a ring-beam or a lining, backfilling and levelling of the ground and casting and fitting reinforced concrete slabs.

The householder then builds the superstructure at his own cost. Advice can be sought from the project team. In some districts, the council provides a door free of charge as an incentive to complete the superstructure within three months.

Once the superstructure is complete, the project team installs the ventpipe, fly-screen and seat insert.

Figures compiled for the project at 30 June, 1988 indicate that:

3497 latrine substructures have been built

2821 latrine superstructures have been completed

5.2 Mobilisation and Health Education Delivery Systems

The experience of ESPP indicated that the development of effective social mobilisation and health education delivery systems were extremely difficult and were the least developed components of that project. Recommendations highlighted the importance of these components but did not provide clear guidelines on how to implement in these areas.

The core project team of SHESP has sought to obtain the support of officers located in relevant institutions to develop and assist in mobilisation and health education. It is clear that the project has to depend on assistance provided from outside the core team for these components, which is not the case with construction. This means that mobilisation is institutionalised in local authorities who direct planning and implementation through the DSC.

Costs for the purchase of equipment, development of materials and organisation of workshops have been financed by UNICEF.

Central Government:

MLGL capacity has been strengthened through the further training of the sanitation sociologist reporting to the SPHE, and while she was training, through the recruitment of a UN volunteer social scientist. Major efforts have been made to develop a more coherent mobilisation and health education approach and to support the development and production of health education materials for the districts. The ministry has also been responsible for undertaking socio-cultural Knowledge, Attitude and Practice (KAP) studies within the framework of a structured monitoring and evaluation programme.

Health education materials were developed in 1986 by a UNICEF visiting consultant. Some assistance has been obtained from the graphics unit of the Ministry of Health. Didactic materials developed for other projects in Botswana and from other projects internationally, have also been used.

Local Government (District Councils):

The DSC and VSC's are expected to work with district and village extension workers, in particular with those officers responsible for the delivery of primary health care. It has therefore been necessary in this aspect of the project to adapt to the methods of the existing health care and social mobilisation delivery systems. The DSC and the VSC make sure that sanitation remains a priority within primary health care.

At the district council level, social and community development officers, health education officers and senior nursing staff have provided support in social mobilisation and health education as part of their general duties.

At the village level, Community Development Officers (CDO), nursing staff, Family Welfare Educators (FWE), Village Development Committees (VDC), the latter's health subcommittees, and the tribal Kgotla have contributed time and effort to the success of the project.

Project staff have procured film projectors, generators and a camera. They have also been provided with a range of materials such as training booklets, posters and flip-charts.

The purchase of equipment, development of materials and organisation of workshops have been financed by UNICEF.

Manpower and transport costs have been financed by councils' recurrent budget. There is a strong element of cost sharing between departments in this respect.

A standardised approaches to project mobilisation and health education have evolved at the village level. The Kgotla is used as the main forum for the introduction of the project to the community. The DSC, the headman and a senior council officer explain the purpose and operation of the project and if the project is accepted by the village, the VSC is selected. Demonstration latrines are constructed in locations chosen by the community. Villagers are invited to visit the construction in progress and to examine the completed unit. A workshop or seminar is organised by the project staff and cooperating extension workers to inform and train all village based extension workers and members of village committees on how the project operates and on how they can assist. The VSC and the FWE encourage registration and clarify points concerning the project during house to house visits. Further Kgotla meetings are held to discuss pertinent issues.

Thereafter, periodic health education workshops are organised. These are usually multi-issue training sessions designed to educate village committee members on a variety of health matters. Facilitators from a number of departments present different themes followed by discussion and work groups. Project staff participate fully in such workshops and provide audiovisual materials.

Family Welfare Educators, Health Assistants, Community Health Nurses, Enrolled Nurses, Regional Health Education and Nutrition Officers and members of Village Health Committees have now adopted sanitation and water hygiene education into their routine responsibilities in those locations where the project is operating.

6. POSSIBLE RURAL SANITATION APPROACHES

There are different ways of analysing projects. One, is to look at various components and compare them to an idealised approach. In this instance it was thought that this method would be useful since there seems to have been some ambivalence about the precise objectives of the project and thus the most appropriate mechanisms for their achievement. A degree of ambivalence in interpretation may well be desirable in pilot projects to allow for experimentation and evolution; for national implementation however, everyone involved in the project should have a very clear idea of the necessary mix of delivery mechanisms and approaches if the project is to succeed.

Outlined below are six ideal types of approach which will be used both to help in the analysis of SHESP, to look at recommendations for a national programme and to comment on the Project Addendum.

6.1 Promotion

A promotion approach seeks, by the use of publicity to create a demand for latrines. The promotion may take several forms the most usual of which is the demonstration of examples which are built for inspection within a community.

The philosophy behind a promotion campaign is that the quality of the means of promotion, be it structures, print, mass media or verbal communication, will be sufficient to encourage the target audience to build and use latrines.

6.2 Public Works

A public works approach is primarily a service model. Public authorities aim to provide a target population with high priority facilities. It is often assumed that the population, once provided with the product will use it properly. However, the use of public works products are normally narrowly defined by national and local legislation and payment for use is often exacted as taxes and levies.

6.3 Private Sector Procurement

A procurement approach can be used in one or more components of a project. Private firms, once selected, follow terms and procedures laid down by the project executers. The contractor carries overhead expenses and organises personnel and materials. Timely completion can be encouraged by stage payments and penalty clauses. Supervision and inspection of quality by the executing agency is usually necessary.

6.4 Legislation

Legislation aims at achieving project goals by enshrining them in law. For the success of a legislative approach there must be provision for adequate inspection to ensure that the required goals are indeed carried out to a satisfactory level.

6.5 Primary Health Care

This approach uses the integrated philosophy and delivery system of Primary Health Care to achieve project goals. It is necessary that these goals are encompassed within the aims of PHC and that the target communities already have a PHC infrastructure in place.

6.6 Research

Research is not a pure approach but aids the other approaches in finding more effective ways to facilitate the other approaches and overcome obstacles by technical, operational or administrative means.

7. ANALYSIS OF PROJECT

7.1 Administration

7.1.1 National and Local Plans of Operations

Adequate delivery mechanisms for social mobilisation and latrine construction were not developed until the second half of the project period. This was due in part to the misconception that ESPP had developed these mechanisms. However, all the blame for a slow start cannot be put on the pilot project. Considerable problems of staffing and transport at the district level arose through an unrealistically optimistic assessment of targets and a lack of adequate planning of recurrent budget expenditure; it was assumed incorrectly that an untested methodology could be implemented at full scale without a testing period.

One of the obvious lessons of this experience is that it is impossible to expect rural sanitation projects to be completed in two years. The experiences learned in this project should be used in developing future plans of operation.

7.1.2 National and Local Plans of Action

There have been positive developments in micro-planning and monitoring. By the end of the project district councils were better able to prepare detailed plans of action which are incorporated into the district development plans.

The weak point of national and district planning was that it concentrated mainly on the physical construction of latrines and not on the health education or mobilisation aspects of the project. This was because, at the district level, where funds for mobilisation and health education came from the recurrent budget of the district councils, the strict methods of programming imposed by the project did not apply.

The progress made in planning is clear in that in 1985, the planning was so unrealistic that it was expected that the project would be completed by the end of 1986 despite such obvious constraints as major drought conditions, whereas the plans for 1987 and the first half of 1988 were considerably more realistic and were implemented as planned. This ability to plan activities is essential to district councils in order to implement projects. Since decentralization is a priority of government, this is considered a very positive development.

7.1.3 Ordering Materials

This project required a range of materials to support construction, mobilisation and educational activities. The two different administrative procedures for procuring materials and disbursement of funds used by MLGL and UNICEF were not congruent. Most locally available items were procured by the district councils and MLGL according to established government procedures and reimbursed by UNICEF. Imported materials such as trucks and compressors were bought by UNICEF through their centralised procurement centre UNIPAC in Copenhagen. It is recommended that in the future detailed administrative procedures acceptable to all parties be worked out in advance to avoid needless complications.

7.1.4 Monitoring

A standardised procedure for monitoring of project activities was not developed until 1987. Before then the nature of quarterly reporting varied widely on an individual basis. This made interpretation for purposes of planning, programming and evaluation difficult during the project. However, regular submissions of expenditure reports for the purpose of reimbursement has been practiced throughout.

Standardised procedures are being established for monitoring a range of project activities and associated variables such as health and social mobilisation, on a routine basis. Project monitoring is used as both a management tool designed to support project delivery at all levels, and as an input to an evaluation of project impact. Phase 1 started in 1987 and focusses on two elements of project management:

financial record-keeping and construction activities. Information is collected on a monthly and quarterly basis, flowing from village to the ministry level via the council. Phase 2 will focus on health education and health impact monitoring. Assistance from staff at village and district level outside the project will be required in data collecting.

Individual district coordinators have themselves developed monitoring procedures to support project delivery, albeit on an ad hoc basis. Forms have been developed to monitor the supply and distribution of materials and construction progress. A selection of monitoring forms appears in Annex 7.

It is recommended that district-specific monitoring procedures, where appropriate, be encouraged in order to complement the necessary standardised procedures. A well structured but flexible monitoring process is required which is compatible with a decentralized and therefore an inherently variable delivery system.

7.1.5 Reporting

This section will cover the content and regularity of the various routine reporting procedures in the project and the less formal publicity that is part of project communications.

Annual reports are required by the donor. Quarterly reports to government bodies such as the National Action Group on Sanitation facilitate the monitoring of short term planning goals. Results of the quarterly reports can be incorporated into the annual reports. Council procedures require that departments submit periodic reports to various planning committees. Minutes of committee meetings are distributed and available from appropriate files.

The procedure and content of reports has improved over the years of the project. However the annual report to the donor were overly biased towards the attainment of measurable physical targets (number of latrines built) and did not adequately express the development of community participation, social mobilisation and health education. Other aspects of rural sanitation such as training, socio-cultural studies,

planning, integration with Primary Health Care and institution building, were identified by the presence of a project. This aspect was not funded by the project but was clearly facilitated and carried out by the participants. These could have been included in the annual reports as part of GOB's inputs.

It seems that the difference in perception of the project, between contractual obligations and assistance in development of the rural sanitation sector, has hitherto led to an unfortunate under-appreciation of the many accomplishments of this project.

One of the salient features of ESPP was the concentration on both national and international publicity and public relations. The SHESP project neglected this aspect and as a result is not recognised widely either nationally or internationally for its many impressive contributions and replicable delivery systems. It is recommended that Botswana should publicise its achievements both nationally and internationally. Articles should be published in the local and foreign specialised press and papers delivered at international symposiums and district level seminars. High level technical delegations could be exchanged with other countries interested in sanitation. A detailed countrywide socio-sanitary study of the impact of rural sanitation should be undertaken and published.

7.2 Institutional and Manpower Development

Effective delivery has been constrained by a shortage of suitable manpower at all levels of implementation. This issue of manpower is central to the consideration of the suitability of different delivery approaches to support a national programme. The major concerns are staffing levels and training.

7.2.1 Ministerial Staffing Requirements

A project manager will be required full time in the office of the SPHE at MLGL. This requirement has been voiced by UNICEF and MLGL throughout SHESP and will be even more necessary for a national project. The return of the department sociologist will relieve pressure but she

will be essential to monitoring progress in the national project particularly since research and development plays such an important role. A number of specialist studies should be done which will probably entail hiring temporary consultants. There is a need to clarify staffing requirements for the future. This will have to be done during the initial stages of the national project since the prerequisites for staffing in an urban setting (as in the Kfw project) will be different from those required in rural areas.

A related staffing requirement at ministerial level is within the Water Hygiene Programme. This programme plays an increasingly essential role in the coordination of hygiene education which is not only dispersed across projects and sectors but between different levels of target audiences. At present the programme is being carried by one dynamic woman. Because of the crucial role of the Water Hygiene Programme it is vital that the staff be strengthened.

7.2.2 District Staffing Requirements

The DSC is a pivotal post in the present project. It is clear that if the project is to be replicated at a national level more DSCs will be required. The present DSCs were recruited from the cadre of health assistants. They have proved to be innovative, competent and happy with their work and the associated career prospects. For the last three years no health assistants have been trained and the health assistants' course at the National Health Institute has been discontinued. Health inspectors are too highly qualified for this position and would have unsatisfactory career prospects at this level.

In any case, the output of health inspectors, six sent to Swaziland each year, is inadequate to cover the present public health requirements. With the stated government commitment to improving the rural health infrastructure, there will be greater need both for health inspectors and health assistants if there are to be improvements in environmental health.

7.2.3 Village Staffing Requirements

Village Sanitation Coordinators have worked well in this project. They are the link between the district supervisory planning level and the social and governmental organisations in the village. It seems to have made little difference to their effectiveness whether they have been recruited from the construction or the health field. They are village nominees and as such are in a position to adequately monitor the integrated needs of the project at community level. This is a function that neither the council Works' building inspectors nor the proposed contracting foremen will have any responsibility or incentive to achieve. The cost effective use of labour has been a contentious problem throughout this project. This may be alleviated with a change to a private sector procurement approach to construction. The need for broadly based supervision and coordination cannot be delegated in the same fashion.

7.2.4 Training

Training of both direct project staff and support staff has varied considerably in terms of the type of training received and sources of funding. The fact that no formal training structure has been developed to specifically support the project reflects the fact that the project has been integrated into wider sectoral activities, dependent on a range of institutions, personnel and donor financing.

Training has consisted of courses offered overseas, in-country and in-house. These have been project-specific, sector-specific or institution-specific. Impact on the project has therefore been both direct and indirect.

Almost all project staff at the ministerial and district level have attended courses overseas concerned with water and sanitation sector development. These have included study tours, conferences, workshops, short diploma courses and post-graduate courses.

A number of in-house project-orientated training courses have also been organised for the district project staff and their heads of department. The appointment of volunteer expatriates to work alongside counterparts has provided significant on-the-job training. Councils and the Unified Local Government Service have also organised in-house training courses for all their staff including project personnel. Project staff at the village level, VSC's and builders, beyond some orientation at workshops and on-the-job training provided by the DSC, have not been offered formal training.

Support staff at the district level, particularly those involved in PHC delivery, have benefitted from a range of their own training activities which have had an impact on the project. A notable example is the current re-training programme for FWE's organised through MOH, National Health Institute with the assistance of UNICEF and the World Bank.

Notwithstanding these significant achievements, a more structured programme of training and orientation is required, addressing in particular district and village personnel and institutions either directly or indirectly involved in project delivery. This is all the more necessary as the project develops nationally stretching the capacity of MLGL to provide supervisory support. The nature of this training will be determined according to the approach that a national programme adopts.

7.3 Latrine Design

The Botswana Improved Pit Latrine was designed and modified to respond to the following criteria:

1. Sanitary disposal of human excreta
2. Socio-Cultural acceptability
3. Affordability
4. Ease of construction (replicability)
5. Durability

7.3.1 Technical Considerations

The superstructure is the most noticeable part of the latrine and except for a very limited number of demonstration latrines, it is the responsibility of the householder. It is important to note that most of the technical development concerns the substructure and the accessories and not the superstructure.

There are two different kinds of substructure. In hard ground a ring beam is poured around the pit to support the slabs and superstructure. In unconsolidated ground a substructure is constructed of concrete blocks resting on a poured concrete foundation. The usefulness of this innovation is obvious from the large number of unlined traditional latrines that collapsed during the recent rains including one that resulted in the death of a child in Southern District.

Although lining pits is relatively expensive, any cost savings would come about through a cheaper method and not through a change of strategy. Due to the difficulty of establishing precise guidelines for highlighting the juxtaposition of the underlying subsoil that may result in collapse, lining must be done on a fairly wide scale, erring on the side of safety.

The pit is covered with three slabs that close off the pit and support the superstructure. One slab has a hole for the seat unit, one slab has a hole for the vent pipe and one slab is designed to be removable for pit emptying. It should be noted that the practical difficulties in hygienic transport and disposal of latrine contents in rural areas preclude any serious usage of these removable slabs at present.

A plastic seat insert is provided which greatly facilitates latrine cleaning. These seat inserts at present are manufactured specifically for the project. They need to become commercially available if this method is to be replicated.

Various types of vent pipes and fly screens have been tried from a hessian pipe (chicken wire dipped in a cement mixture), PVC pipe, a block chimney and the present pitch fibre vent pipe made of a tar and wood chip base often used for underground conduits. The fly screen is a stainless steel disc held in place with a plastic cover.

The superstructure is built by the householder and there are considerable variations in the style. It is interesting to note the high level of construction. Although any style of construction is permitted, the majority of people have adapted cement block construction with lockable wooden doors and a corrugated iron roof. In the cases where the house is painted, the latrine is usually painted in the same colours. Often privacy walls are constructed.

7.3.2 Cost Analysis: Construction

The following costs are average costs per item based on a reasonably efficient use of manpower, manpower being a relatively fixed charge. Manpower costs per unit will vary according to the number of units constructed. Transport costs vary with distances as well as efficiency. Superstructures are built by the householders and prices can vary 30% above or below depending on style and material. Sometimes doors are provided by the project as an incentive for quick construction.

The pecuniary implications differ between latrines in consolidated and unconsolidated ground and are given separately.

<u>Household Expenses</u>	<u>Unconsolidated</u>	<u>Consolidated</u>
Superstructure		
Materials		
Blocks	50	50
Cement	12	12
Rafters	4	4
Roofing	8	8
Doors	8	8
Paint	4	4
Labour	90	90
Substructure	30	0
Accessories	<u>30</u>	<u>30</u>
Sub-total	236	<u>206</u>
<u>Project Expenses</u>		
Substructure		
Materials		
Blocks	55	0
Concrete foundation	20	25
Cement	12	0
Compressor costs	0	25
Labour	50	50
Accessories		
Slabs	30	30
Vent pipe	10	10
Fly Screen	2	2
Seat liner	35	35
Door	8	8
Household contribution	(30)	(30)
Labour	4	4
Transport	<u>126</u>	<u>126</u>
Sub-total	322	285
UNICEF Contribution	P215	P171
District Contribution	P107	P114
TOTAL	P558	P491

Commentary

The total construction cost of a latrine in this project was P558 in unconsolidated ground and P491 in consolidated ground. In unconsolidated ground the household contributed P236 or 42% of the cost, UNICEF contributed 39% and the District 19%. In consolidated ground the household paid 42%, UNICEF 35% and the District 23%.

A major part of these costs was for transport, P126 per latrine which is 23 to 26% of the total cost or 39 to 44% of project costs. UNICEF provided 42% of the transport funding and the districts 58%. It is quite clear that if major economies are to be realised, they must come from savings in transport.

Labour costs provided by the project were P64 per latrine. These costs were funded by the district. They represent 11 to 13% of the total cost and 20 to 22% of the project costs.

NOTE: This cost analysis does not replace the detailed in-depth cost analysis requested but not done by a previous consultant. An audit of the project with an in-depth cost analysis indicating precise savings remains desirable.

7.4 Logistics for Latrine Construction

The effectiveness of on-site construction is contingent upon a reliable and affordable system of logistics and is therefore a major consideration in the assessment of a variety of approaches to sanitation delivery. This is of particular significance in this project where district councils have used a public works approach.

7.4.1 Procurement

At the beginning of the project, district teams had neither the training nor the experience to adequately plan in detail activities for the following year, thus procurement proceeded somewhat erratically. These problems were partially resolved during the project. Vent pipes,

fly screens, seat inserts and health education material are procured in Gaborone and distributed by the districts, although this distribution does not seem to be thoroughly planned in advance and there have been problems of quality control. There are certain problems in procurement of materials that are inherent to council procedures.

7.4.2 Transport

District councils were responsible for the transport costs of this project and (although most vehicles were provided by UNICEF) these costs from their recurrent budget were a major part of their expenses. A detailed analysis is impossible as part of this report, but it is probable that substantial savings could be made from a better organised approach. Materials, including wire mesh, cement, sand and gravel are transported to a central area where the slabs and blocks are made. The finished materials are transported to the village and finally to the latrine site. Supervision and manpower movement are substantial.

7.4.3 Storage

There are storage facilities for both new and finished materials at both the central yards located at convenient District Works and also in the villages at the health facility where an area is set up for the sanitation programme.

7.4.4 Slab Construction

Slabs were made at a central yard by council employees from moulds provided by MLGL under supervision by the local VSC. There were usually adequate quality control procedures. The finished slabs were transported to the village in five ton trucks provided by the project.

7.5 On Site Construction

7.5.1 Technical Support

There were four levels of technical support which seemed to adequately convey the major principles of VIP latrines but also allowed innovation and adaptation of the basic design. The MLGL gave technical support through consultation, training, plans and sanitation booklets to the District Sanitation Coordinators who in turn advised and supported the Village Sanitation Coordinators who were responsible for the construction teams and advising village latrine builders.

7.5.2 Building

The project was responsible for constructing ring beams and building substructures in unconsolidated ground. Since these parts of the latrine are not visible after latrine construction it is impossible to comment on the quality of work. The project also manufactured the slabs which are obviously high quality. The householder was responsible for the construction of the superstructure which was generally of very high quality. After the construction of the superstructure the project installed the vent pipe and seat insert. In one region the vent pipes and seat inserts were installed before the completion of the superstructures which, from the point of view of logistics, seems to be a more efficient method. This method, however, had adverse motivational effects.

The physical construction of latrines was slow in the beginning. The delivery system from the district still has difficulties associated with staff and transport. Despite inherent limitations and inefficiency in the delivery mechanisms, district and village sanitation coordinators have developed a viable and flexible modus operandi which has enabled them to achieve extraordinarily high construction figures in the last 18 months. The availability and use of council labour and transport do not facilitate project implementation and this delivery mechanism, using a council labour approach to construction has staffing and expenditure implications for district councils which make this approach difficult on a national scale.

7.6 Social Mobilisation

The difficulties of social mobilisation were underestimated during the planning of the project. The mobilisation was developed with a multi disciplinary approach which included workshops with participants from health, social and community development, and education Sectors. Also in attendance were political and administrative leaders, traditional and religious leaders. This approach is slow in coming to fruition but the long term progress is impressive. In 1984 and 1985 there were only 500 participants signed up for the programme. Between 1986 and 1987 over five times this number of households were enrolled.

Family Welfare Educators, Health Assistants, Community Health Nurses, Enrolled Nurses, Regional Health Education and Nutrition Officers and members of Village Health Committees have now adopted sanitation and water hygiene education into their routine responsibilities in those locations where the project is operating.

7.6.1 Participation

At the village level mobilisation and participation in health matters use a Primary Health Care model in which elected community members including the Family Welfare Educator (FWE), the Village Health Committee (VHC) members and the Village Development Committee (VDC) members in collaboration with village extension workers, play a crucial role. Participation in both planning and implementation at this level of the project has improved considerably. Tribal leaders and the VDC in selected villages are mobilized by the district sanitation coordinator. If interest is shown in the project, the matter is discussed by the community and project staff at a Kgotla meeting, sites for demonstrating the technology are chosen and village sanitation coordinators are selected. As the project has progressed the participation element has strengthened with the VDC and the FWE sharing administration and mobilization duties with the VSC.

At the district level participation was slow to start. Although VSC's were appointed in designated villages, effective supervision and planning from district health staff was lacking. A relocation of health staff from the Ministry of Health to local government under a government decentralization policy was in a transitional period for the whole duration of the project (regional health teams only being relocated on June 1st, 1988). An effective distribution of resources and responsibilities between local and central government, particularly for environmental health has yet to be made evident and it is recommended that this matter be urgently addressed.

Participation in implementation at the household level has always been good. Approximately 90% of the super structures in SHESP are completed by the households within three months. For the latest quarter ending in June 1988, 2821 of 3204 (88%) were complete. During the dry season after the population returns from the lands, this percentage increases.

The payment of the registration fee of P30 (sometimes in installments) has been completed before work on the substructure has finished. Pit digging by the householders has proceeded as planned except where rock has necessitated the need for jackhammer and compressor.

The materials used for superstructures, the householder's responsibility, varies with socio-economic status. The money to buy materials may sometimes take a while to raise. We saw no evidence, however, that latrines would not be completed, rather that their acquisition and display were a matter of family pride. The incentive of a free door also seems to have motivated rapid completions.

7.6.2 Demonstration

The village committees chose demonstration sites which conformed to the developed feeling for equity within communities. Although some were built at clinics and Kgotlas, the majority were located in the homes of destitutes who would not otherwise be able to acquire such facilities.

The demonstration and promotion of a safe technology was particularly successful, the construction of substructures and the offset pit were very much appreciated in areas where pit collapse is common. The stability of this as opposed to other designs has been most marked in the recent heavy rains.

The tapering seat insert was perceived to be hygienic, easy to clean and safe for children. The vent pipe with its elimination of smells and flies well understood and appreciated. In this project, demonstration latrines have been a great success and should remain an integral feature of promotion in the national project.

7.6.3 Motivation

The slow pace of implementation in the first two years did not detrimentally affect motivation at village level. This was partly a function of the pattern of life in Botswana where the building season (July to October) is short. Many people are absent from the villages at lands or cattle posts for the rest of the year. Indeed, the extended mobilization period probably had a positive effect in that in this project, as in few others, adequate time was allowed for attitudes to be changed, decisions to be made and money to be set aside for registration and building materials.

7.6.4 Delivery System

At the village level the mobilization delivery approach outlined in "The Handbook for District Sanitation Coordinators", has latched onto an existing and viable Primary Health Care system. Aspects of the handbook such as staffing levels need revision in the light of evolution during the project of sanitation in the PHC context. The increased consciousness on the national, district and community level that many common diseases are preventable through environmental health measures has strengthened the role and status of the FWE in the community and given the project a good platform from which to operate.

Despite this opportune marriage at the village level the delivery system was the weakest element in project planning. Organizational elements in ESPP on which SHESP was built, differed in crucial ways from SHESP. ESPP was a limited research and promotion project and despite the observation that a replicable package should be developed, the delivery mechanisms both at district and community level were inadequately tested.

7.6.5 Consensus Building

Successful social mobilization requires a mechanism which effectively coordinates the various interested and influential parties and through participation and promotion raises their particular priorities for actions which achieve project goals.

At the village level, good relations between tribal administration, local elected members of the VDC and the VHC and policy directives from district and national level on the necessity for adequate sanitation have been strengthened and focussed by the Village Sanitation Coordinator, supervised by the DSC. A process of effective sanitation technology promotion, started in ESPP and continued in the peri-urban SHHA projects, addressed the problem of difficult terrain that most Batswana faced if they wanted to build a household latrine. This problem was clearly a major stumbling block to sanitation provision and must go some way in accounting for the very low sanitation coverage in rural areas (as low as 12% in villages under 5,000 people).

Consensus building among village institutions and social pressure on individual households have had a marked effect on project villages. We could not find many households in or out of the project which, if it did not have a latrine, was not registered or in the visible process of building one. In Southern District's communal first development area, the VDC at Good Hope is strongly recommending that the land board stress the necessity of immediate sanitation provision to all prospective plot holders and we saw several new plots on which only the latrine had been erected. Where access to building materials in remote locations is difficult, cooperation between villagers and advice from project staff has enabled bulk purchases to be made at reduced costs.

At the district level, a concern for sanitation by the urban and rural councils has been building since the mid 1970's, strengthened by a needs assessment in 1978. Following testing of technology, GOB in collaboration with USAID initiated the ESPP project which generated excellent promotion, both at national and international level and raised the priority for rural sanitation in Botswana. This encouraged UNICEF, with funding from the Netherlands to invest in the SHESP project. Despite a continual, and to the writers, inexplicable undervaluation of the achievements of the UNICEF/GOB SHESP project, MLGL with the help of interministerial committees has kept the issue of national sanitation provision in the forefront of national priorities for discussion. This has resulted in the Project Addendum, to be discussed later, which aims "to continue and expand the district council sanitation awareness, campaigns and household latrine construction projects" on a national scale.

7.7 Health Education

Health education using a PHC and promotion approach is at its most effective as a multi media campaign, approaching the range of target audiences at the rural level through a variety of communication channels.

7.7.1 Themes

Since PHC is the major mobilisation delivery system at the village level the themes covered the complete range of water, sanitation and health related topics and in particular the control of diarrhoeal diseases, Oral Rehydration Therapy and the need for latrines. A related theme used by agricultural extension workers, connected cow measles (taeniasis) with indiscriminate defecation and used the economic incentive of infected and unsalable beef as a promotion for latrine use. In addition to the health themes, targeted construction advice and plans for building, use and maintenance have been produced and disseminated.

7.7.2 Audio Visual Supports

Manuals, leaflets, calendars, T-shirts, radio messages, films and movable pictures on magnetic boards have all been used. Except at the local level, such a wealth of material is not evident. It comes from different agencies and government departments, often via totally different projects which are focussed at the community level on a Primary Health Care delivery system. Excellent handbooks for the FWE were produced with a set of posters by UNICEF. MLGL have produced T-shirts and pamphlets and have 'bought in' a range of educational aids. The Health Education Unit in MOH, the Non Formal Education Unit in MOE and the Department of Water Affairs in MMRWA have all produced materials that are used at the community level and in training.

7.7.3 Channels of Communication

Materials are used in health seminars at district, village and national level. FWE's and adult education teachers use them as part of their educational and health promotion work. Health education has been introduced into the school curriculum but needs to be reinforced. The clinics and health posts that were visited had posters that were used for health education advice. In 1987 a PHC calendar was mass distributed whose monthly message coincided with complementary themes on national radio.

7.7.4 Target Audiences

In theory, the target audience for sanitation promotion and hygiene education encompasses the whole population in the project area. In practice, however, populations are not homogeneous; they differ in sex, age, socio-economic and social status, education and ethnicity. Each major grouping provides different evidence for special attention; women nurture, cook and perform primary socialisation and educational roles, men take decisions on the distribution of household priorities for resources, young children are more vulnerable to excreta related diseases and school children more easily influenced to change hygienic habits.

The ad hoc approach to planning applies to this aspect as to many others. The informal consensus that sanitation is a priority to be addressed has, through serendipity, spread hygiene and sanitation messages across a large proportion of the priority audiences. Although some hygiene education is in the school curriculum, it could be more comprehensively stressed. Within the social structure of schools, the prefect system, school clubs and extra curricula class activities could encourage hygienic practices. Attention also needs to be paid to the quantity and quality of text books at all levels of the school curricula that relate public health and hygiene to disease. We understand that this latter issue has already been raised at one of the more influential national committees.

It is of some concern that health education does not always reach the household level with any impact. The recommended socio-cultural study should among other things, be able to assess what impact there has been and what cultural constraints to hygiene need to be addressed. Participatory approaches to community education like those used in Lesotho could probably benefit the national project.

7.8 Socio Cultural Impact

7.8.1 Replicability

The UNICEF/GOB project is much closer to replicability than ESPP ever was. Problems still remain to be resolved in the present mobilisation delivery system at all levels and refinements need to be made to procedures and logistics. A major change presently being tested in the Kfw project under LC51 will be the use of a procurement rather than a public works approach for latrine construction. There are clearly a mix of factors which contribute to self sustaining growth. A thorough study needs to be made of the social variables that effect the motivation for latrine construction. It should be possible to obtain this data from a study of the present project. Each district should move ahead with caution, fine tuning the present successful approach of this project.

One question which remains is the effect that this programme and the assistance approach will have on the villages not included. The commitment to assist all rural householders has not, nor can it easily be made by GOB. If this is not clear, there may be serious repercussions for future, purely promotional schemes.

7.8.2 Sustainability

The sustainability of a project rests in the capacity at all levels to retain and maintain project goals and objectives. At the village level it is evident that the technical capacity and motivation for construction is present even after the project has moved. District level logistics, planning and management capacity have improved considerably over the 4 year project period. Staffing and transport arrangements still leave much to be desired. It remains to be seen whether the Public Works departments have the capacity for the additional contracts that will need to be serviced under a procurement model for construction. It is at the ministerial level that the major problems lie. Training of staff to fill key posts at the district level must be institutionalised as a matter of urgency and a post created at MLGL with special responsibility for coordinating the rural sanitation effort.

7.8.3 Applicability of Technology

The technology of these latrines is applicable in so far as they are hygienic and odourless, people like them and they do not fall down. At present the optional emptying capacity is not culturally acceptable and even if, in the 8-11 years projected life of the latrine, customs and practices change, the single pit will not be safe to empty manually until a year after it has ceased to be used.

Vacuum tanker provision at the rural level is not at present a viable technical or financial option. The technology for desludging has not yet been perfected to a replicable scale. Districts' existing capacity to purchase and maintain its existing vehicular requirements is already overstretched.

The annual cost of the present latrine, amortised over eleven years is P50. If this is considered beyond the reach of the population the necessity for a solution remains.

This project is now being replicated at a national scale and although investigation into viable technical and hygienic options with the Botswana Technology Centre are underway they must be reinforced by including within the proposed cost analysis the incremental costs of alternating twin pit and other options.

7.8.4 Affordability

Because the superstructure is built by the households it allows them to build what they want at a price they can afford. The problem of destitutes has already been addressed at village and district level. Demonstrations are built in the homes of those unable to afford latrines and two of the councils have decided that the P30 levy will be recycled into provision of latrines for the poorest. We were told that people could not afford the costs, which range from P180-300 for those registered with the project, and from P200-1500 to those on the open market. It was equally clear, however, that people could and did afford the price of a latrine. We visited the village of Manyana in Southern District which had never been in a project. There, with 2 crusading FWE's, the sanitation coverage was between 85 and 90%. In one village in Central District people are prepared to pay all costs but have approached the council for a loan of the compressor and jackhammers to penetrate rock for the pits.

This raises the fundamental question of national subsidisation. The present average household cost of rural water provision is P1950 in villages under 5000 and the water scheme is intended to cover all recognised villages. In this context a subsidisation of sanitation in the range of P300 per household seems not entirely unreasonable.

7.9 Cost Analysis

	UNICEF	DISTRICTS	MINISTRY OF HOUSEHOLDS LOCAL GOV'T AND LANDS	UNDP/WB UNV, IVS	TOTAL	PER CENT
1 MOBILISATION/ HEALTH EDUCATION						
MATERIALS	34	3	10	25	72	1.7
PERSONNEL		100			100	2.4
TRANSPORT		148			148	3.5
SEMINARS/MISC	12	5			17	0.4
SUBTOTAL	46	256	10	0	337	7.9
2 LOGISTICAL SUPPORT						
VEHICLES	322	18			340	8.0
EQUIPMENT	212				212	5.0
PERSONNEL		158			158	3.7
FUEL AND OIL		210			210	4.9
MISCELLANEOUS	16	16			32	0.8
SUBTOTAL	550	402	0	0	952	22.4
3 CONSTRUCTION						
MATERIALS	442	-90		360	712	16.8
LABOR		440		360	800	16.8
SUPERVISION		90			90	2.1
SUBTOTAL	442	440	0	720	1602	37.7
4 MANPOWER TRAINING						
TRAINING	8	16	80	155	259	6.1
MATERIALS		3	6		9	0.2
SUBTOTAL	8	19	86	0	268	6.3
5 RESEARCH/DEMONSTRATION						
MATERIALS	20				20	0.5
LABOR		12			12	0.3
STUDIES/EVALUATION	46			30	76	1.8
SUBTOTAL	66	12	0	30	108	2.5
6 SUPERVISION/PLANNING						
PERSONNEL		48	60	470	578	13.6
TRANSPORT		192	25		217	5.1
OVERHEAD/MISC		60	50	25	135	3.2
FREIGHT	48				48	1.1
SUBTOTAL	48	300	135	0	978	23.0
7 TOTALS						
	1160	1429	231	720	4245	100.0
8 PERCENTAGE CONTRIBUTION						
	27.3%	33.7%	5.4%	17.0%	16.6%	

7.9.1 Commentary on Cost Analysis

This cost analysis is not based on an audit. It attempts to demonstrate the various inputs into rural sanitation based around the UNICEF assisted Government of Botswana implemented Self Help Environmental Sanitation Project.

37.7% of the total investment went to directly finance construction. In terms of balance this seems entirely reasonable.

Logistic costs accounted for 22.4% of the total cost. Equipment remaining at the end of the project has a depreciated value of P267,000.

Supervision, Planning and Miscellaneous, accounted for 23%. This would seem somewhat high except that much of this (44%) was salaries of expatriate experts and volunteers.

Training accounted for 6.3%, Social Mobilisation for 7.9% and Research 2.9%.

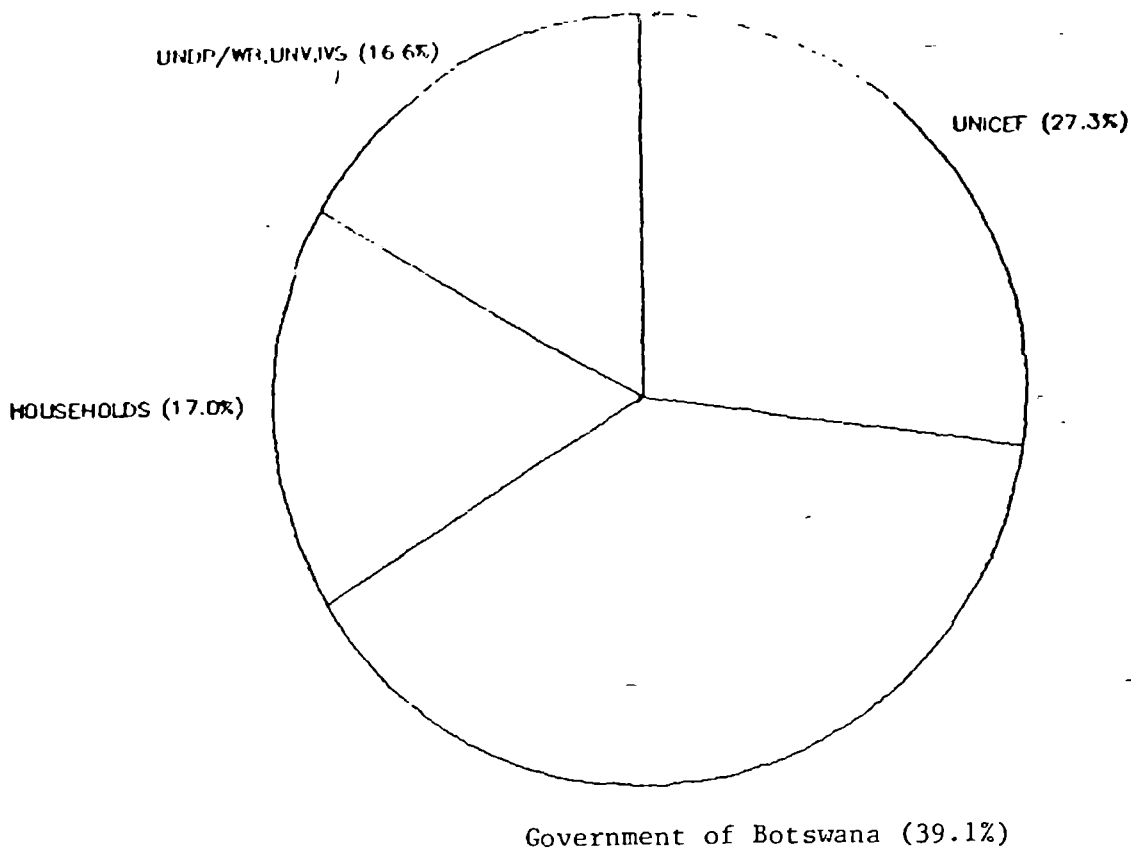
These activities were financed as follows:

Districts & MLGL	39.1%
UNICEF/Government of Netherlands	27.3%
HOUSEHOLDS	17.0%
UNDP/World Bank, UNV and IVS	16.6%

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FINANCIAL CONTRIBUTION

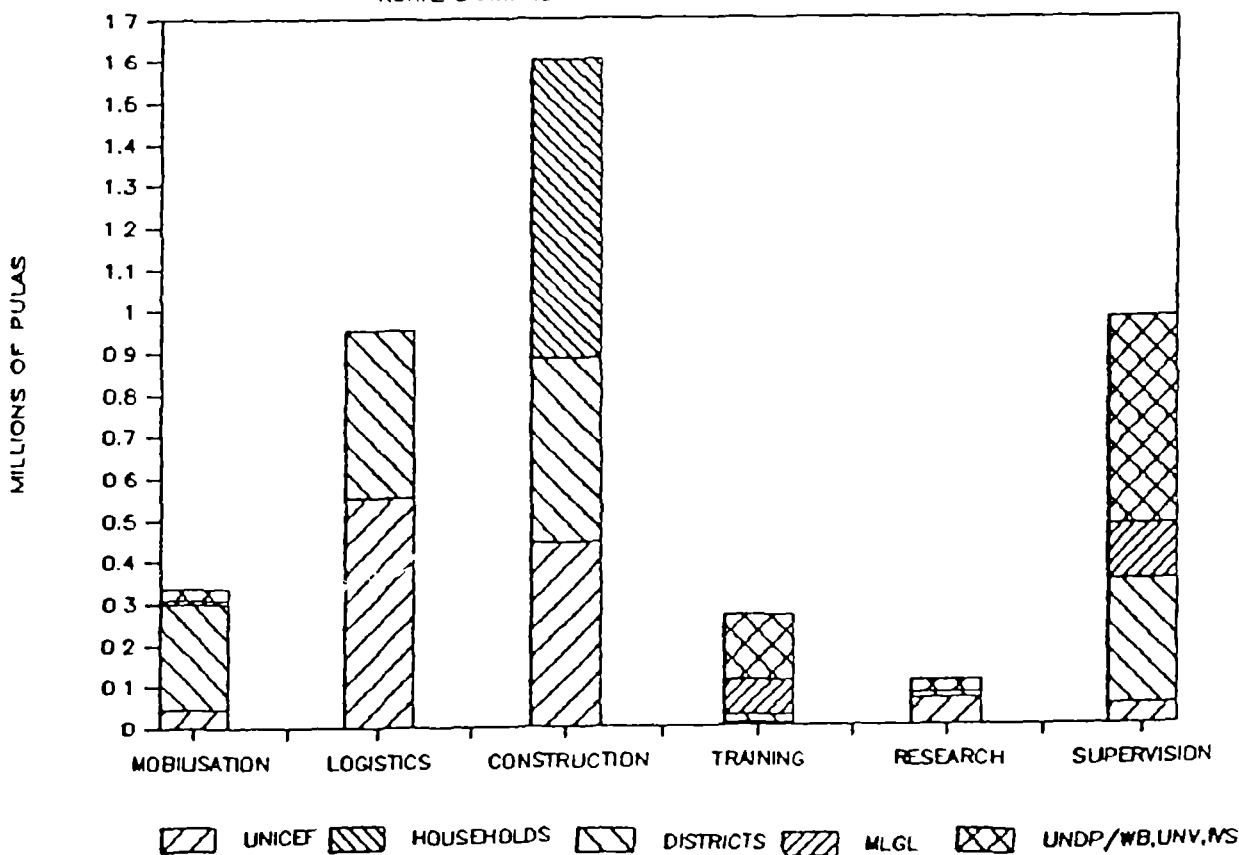
RURAL SANITATION 1984 - 1988



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FINANCIAL CONTRIBUTION

RURAL SANITATION PROGRAMME 1984 - 1988



7.10 Coordination and Cooperation

7.10.1 The International Level

Donors and ministries involved in the water and sanitation sector have formal forums for cooperation and coordination. These are provided by committees set up between ministries and donors involved in particular programmes.

The most powerful of these is the GOB/UNICEF committee which brings together Ministry of Health, Ministry of Education (Department of Non Formal Education and Curriculum Development), Ministry of Labour and Home Affairs (Women's Affairs Unit), Ministry of Local Government and Lands (Social and Community Development Department and SPHE section), Ministry of Agriculture (Rural Development Unit), and is chaired by the Ministry of Finance and Development Planning at the senior officer level. From the donors' side UNICEF is represented by the country representative and project and planning officers responsible for UNICEF adjudicated programmes. Participating observers attend from United Nations Development Programme, World Health Organisation, United Nations Family Planning Association and the World Food Programme. Currently under discussion in this committee is the need to provide coordinated national health education which would link the mainly ad hoc provision in the public sector to school education.

7.10.2 The National Level

Interministerial and institutional coordination related to the sector focusses on two major committees. The Interministerial Committee on Water Supply & Sanitation was initiated in 1981 by the MLGL and DWA, and is chaired by the latter. The Ministry of Health is also represented on the committee. Subcommittees are convened when necessary. One such, the Steering Committee for Water Pollution Control is currently formulating national guidelines.

The national Action Group on Sanitation was established at the initiative of MOH to more firmly integrate this ministry's involvement in sanitation programmes. Its role and function are currently under review.

Neither body is chaired at the Permanent Secretary level and therefore only have an advisory and not policy-making function.

7.10.3 District and Local Level

Public health departments and health planning committees play an important role in approving and coordinating sanitation activities at urban and rural council level. All projects must pass through council for approval after advice from the relevant committees. Although in theory development decision-making is decentralized, in practice, council scope for deployment of resources is limited by their high dependence on central government financing through donor funding, domestic development funds and deficit grants. The major forum for debate of development issues and priorities is the annual conference of District Development Committees which debates and formulates resolutions arising from the community level VDCs.

8. ASSOCIATED PROJECTS

8.1 Sanitation

8.1.1 City/Town Council Urban Sanitation Projects

In urban areas in Botswana approximately 20,000 ventilated improved double pit latrines have been built as part of site and service schemes. The design was developed under a World Bank/UNDP project. The substructure is constructed by contractors supervised by the council and the superstructure by the plot holder with help from Self Help Housing Agencies. The substructure costs P450 and the superstructures range from P100 to P250. Pit emptying is done on a routine five year cycle. The effluent is currently discharged into municipal sewerage ponds. This is recognised not to be the ideal solution. Ongoing research and development into design of latrines and evacuation and disposal techniques is built into the progress of the project.

It is probably the awareness of these well organised and efficient schemes, recognising and coping with the exigencies of urban growth, that have given on-site sanitation an acceptable place in Botswana society.

8.1.2 MLGL Project Nos LG 23/26 and LG 20

The construction of schools and health facilities are tendered out by local authorities with on-site sanitation provision (where there is no water-borne sewerage) as integral to the contract. MLGL, through the section of the SPHE, with the chief council architect, have just produced updated standard designs based on the alternating twin pit row principle. This may alleviate presently intransigent evacuation problems.

These facilities will increasingly provide acceptable demonstrations of the technology and principles of sanitation across the country as part of routine infrastructure provision.

8.1.3 MLGL Project No LG 51

Central district council with funding from KfW has just started a self-help on-site village sanitation scheme using private contractors to build substructures. This will provide 1800 single VIPs in 5 major villages over three years. The project is tied into the major village infrastructure project in which MMRWA is upgrading water supply and MOH/HEU is coordinating hygiene education to provide an integrated approach to health within a single programme. This project will provide a pilot for the private contractor option outside the site-and-service context.

A schistosomiasis research project is presently being implemented in three villages in North West District with SIDA funding. It is using a case control method and an integrated water supply, sanitation and health education intervention. Together with the above project this will serve as a pilot for the explicit integration of water, sanitation and hygiene education.

8.2 Hygiene Education

8.2.1 MOH/SIDA Water Hygiene Programme

A water hygiene campaign was started in 1984 through MMRWA, funded by SIDA, as a response to the lack of public participation in the provision or care of SIDA funded rural water supply schemes. This has now grown into a full blown programme and has been transferred to the HEU of MOH. The programme head does an excellent job coordinating the need for promotion, training and communication between agencies and ministries for water and sanitation. The programme provides a regular delivery of promotional material and training at the district and community levels. It coordinates promotional and training needs as a function of its unique position as unofficial communication agency in touch with the public, government and donor agency staff at all levels of the water and sanitation sector.

8.3 Water

8.3.1 SIDA/DWA/MLGL

This ambitious project, addressing the most pressing of the country's needs, provided potable water to 284 villages by April 1987 and is expected to complete another 99 village water supplies between 1986 and 1992. It will also establish an operation and maintenance capacity at district council level.

The programme began as a construction project, but by 1984 the need for associated water hygiene promotion was recognised. Although presently the links between this major water provision programme and sanitation are weak (through the informal inclusion of sanitation into the water hygiene programme), the obvious connection of health between the two areas would make a more formal association sensible.

8.4 Primary Health Care

8.4.1 GOB, MOH/WHO

Primary Health Care is well developed in Botswana serving over 90% of the population. Nearly every village in the country has at least one FWE chosen by the villagers and trained and employed by MOH. Primary Health Care at community level is linked into governmental, traditional and voluntary bodies via the Village Extension Team, the VDC and the VHC. It provides a powerful and effective mobilisation and delivery mechanism. Its operation and function are constantly under review, currently via the:

8.4.2 Health Status Evaluation

The National Health Status Evaluation Programme is implemented by MOH, MLGL, National Institute of Research, University of Botswana and NORAD.

8.4.3 Retraining FWE's, UNICEF/World Bank/MOH

A study carried out under the National Health Status Evaluation Programme suggested that it was necessary to move FWE's from clinic orientated duties to household and community activities if environmental health was to improve. The reorientation of the position of FWE's in PHC is being addressed by a retraining programme. UNICEF is supporting the pre-service training and the World Bank is supporting the in-service training.

9. EXAMINATION AND COMMENTS ON PROPOSED PROJECT ADDENDUM

The project addendum was prepared in 1986 by Economic Consultancies (Pty) Ltd for MLGL with funding by UNICEF. In its present form it is neither a plan of operations nor an operational guideline for rural sanitation and should not be used as such.

One of the terms of reference of this evaluation was to examine and comment on the project addendum prepared, "to support continuation and expansion of the project in the future with the intention of establishing a national programme."

The project addendum was a financial success in so far as the budget allocation for rural sanitation has been increased from P2.2 million to P7.9 million for the NDP 6 period.

However, the document should not serve as the basis for national rural sanitation policy or for a national project. The proposed addendum incorporates many of the assumptions of the earlier stages of the rural sanitation project but does not include the lessons learned during the life span of SHESP. In particular, the following elements are important:

Success of Self Help

While it is true that the Self Help approach does take a great deal of planning, training and mobilisation so that the number of latrines constructed in the first two years was disappointing, the incredible progress since 1986 indicates that rural householders accept and appreciate this approach in the long run.

Level of Subsidisation

The experience of the SHESP demonstrates clearly that most rural householders are both willing and able to construct the superstructure and pay an additional P30 even if the money is not immediately available according to an externally imposed timetable.

Decentralization

The SHESP has demonstrated the viability of full community and district participation in all phases of the project from planning and policy development through mobilisation and implementation. Although slower than policy directives from the central government the final results are most impressive.

Education and Mobilisation

Health education and social mobilisation are essential to the success of any rural sanitation programme. It must be remembered that this project was implemented by health agents, District Sanitation Coordinators and Family Welfare Educators.

Programme Elements

An infusion of money is not the main criteria for implementation of a rural sanitation programme. A great deal of time and effort must go into mobilisation, staffing, training new staff, planning, supervision, consensus building, quality control, advice to households, as well as effective monitoring and evaluation.

Donor Funding

External donors appreciate fully integrated projects and are less willing to finance hardware projects unless the software components are explicitly included.

The commitment of the Government and People of Botswana to effective rural sanitation from the Ministry of Planning and Finance, the MLGL, the MOH through the district councils and in the villages through headmen and village committees is impressive.

ANNEX 1: STATISTICAL INDICATORS

Key Indicators for Monitoring Child Health	1980	1984	1985	1986
Births (per 1000)	44.0	50.0	55.0	52.0
Infant Deaths (under 1)(per 1000)	3.1	3.3	4.0	3.4
Child Deaths (1-4) (per 1000)	1.7	1.7	1.5	1.2
Infant Mortality rate (per 1000 live births)	73.7	66.4	72.0	72.1
Under 5 mortality rate (per 1000 live births)	117.2	105.0	99.0	103.3

GNP per Capita US\$ 920

Health Indicators	1981	1983	1984	1985	1986
One year Old fully immunized against T.B.	91	83	70	68	68
Dyphtheria/Persussis/Tetanus/Polio	70	71	82	68	65
Measles	45	69	77	67	61
Pregnant women fully immunized against Tetanus	68	76	75	68	61
No. of ORS packets per 1000 infants and children	32	29	24	17	18
	10	194		194	1,127

Demographic Indicators	1984	1986
Total population (thousand/million)	1,049	1,100.
Population 0 to 15 yrs. (thousands)	543	543
Urban population (% of total)	20	22
Life expectancy at birth (year)	57.2	58
Fertility Rate (per 1000 population)	6.9	6.7
Grude birth rate (per 1000 population)	47.8	47
Crude death rate (per 1000 population)	13.7	13

Water and Sanitation Indicators

Cost of Rural Water Provision

Size of Village	Total Cost of Scheme	Cost per Household	Cost per Person
5,000 persons	P 1,300,000	P 1,716	P 260
2,000 persons	P 500,000	P 1,650	P 250
800 persons	P 300,000	P 2,475	P 375

Source: MLGL 1988: Assumes average cost including borehole with reservoir, articulation, standpipes and overheads. Household is defined as 6 persons.

Water Sources and Principal Source of Water	No.	%
Pipe indoors	15	1
Village Standpipe	769	46
Borehole or well	577	34
Flowing river	56	3
Sand river	156	9
Dam, lake, pan	98	6
Other	17	1

Means of Human Waste Disposal

Type of Provision	No.	%
Flush toilet	16	1
Private Pit latrine	210	12.5
Communal pit latrine	41	2.5
Communal bush	1,426	84

Source: National Health Status Evaluation June 1986. Epidemiological survey based on subsample of Continuous Household Integrated Programme of Surveys (CHIPS), a country wide and statistically representative sample of the population of Botswana

NDP5 Health Training Targets and Achievements

Personnel	Targets 1980-1985	Achievements 1980-1985	Difference
Family Welfare Educators	450	584	+134
Enrolled Nurse	760	608	-152
Enrolled Nurse Midwife	120	80	-40
Reg. Nurse Midwife	250	331	+81
Nurse Anesthetist	10	7	-3
Family Nurse Practitioner	75	43	-32
Community Health Nurse	70	59	-11
Psychiatric Nurse	25	20	-5
Nurse Administrator	20	12	-8
Nurse Educator	30	32	+2
Health Assistant	90	69	-21
Laboratory Assistant	40	45	+5
Pharmacy Technician	35	64	+29
Health Educ./Nutrition Officer	30	18	-12
Health Administrator	30	7	-23
Dental Therapists	10	0	-10
Health Inspector	20	4	-16
Pharmacist	12	8	-4
Physicians	8	8	0
Nutritionist	3	0	-3
Medical Records Clerk	21	8	-3

The evaluation team will address the following in their evaluation:

Primary Objectives

1. To comprehensively review, note and comment on the objectives and plans of action set out in the original and revised, "Plan of Operations" prepared by UNICEF/GOB for the Self-Help Environmental Sanitation Project. Particular attention should be paid to the nature of these objectives, the strategies proposed to achieve them, and methodologies proposed for the evaluation of objectives set.

2. To compare the actual performance of the project against the objectives and plans of action noted above and in so doing:

- (a) trace the historical development of the project since its inception to the present;
- (b) assess the extent to which objectives set have been met, with identification of reasons for the achievement or non-achievement of those objectives.

Such review should consider three major project areas:

- (i) latrine construction activities;
- (ii) health education delivery and project mobilization;
- (iii) manpower/institutional development in relation to implementation capacity, particularly at local authority and community levels.

Secondary Objectives

1. To examine the sanitation technology used and subsidization policy in the project with specific reference to:

(i) its affordability to a (a) government and (b) household;

(ii) appropriateness of the technology in terms of

(a) social acceptability at the community level, and

(b) effectiveness from a public health point of view.

2. To review the development of health education activities associated with the project in terms of:

(i) strategies and approaches adopted;

(ii) development and dissemination of health education materials.

3. To review the institutional development of a delivery mechanism to execute the project, from its inception to the present, with particular emphasis on the role of District Council and community-based manpower and institutions. In this regard, it will be necessary to examine and comment on the recently submitted project addendum prepared by a consultant on behalf of this ministry of support continuation and expansion of the project in the future with the intention of establishing a national programme.

4. To identify and provide explanations for the major constraints which have affected the execution of the project, noting what efforts have been made to overcome these constraints.

5. To suggest definitive recommendations on how to overcome such identified constraints, and to improve the overall direction and delivery of the project. In so doing, recommendations provided must be relevant to social, economic and institutional conditions existing in Botswana.

6. To identify areas of project activity warranting further applied research in the future.

ANNEX 3

MEMBERS OF THE REFERENCE GROUP

Ministry of Local Government and Lands.

B.K. Sentle	Acting Under Secretary (Rural) - Chairman
K.A. Selotlegeng	Senior Public Health Engineer
J.A. Gadek	Senior Public Health Engineer - Advisor

Ministry of Health

J. Sibiya	Principal Community Health Officer
T.A. Pule	Chief Health Inspector

Ministry of Finance and Development Planning

G. Monomati	Planning Officer
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Kweneng District Council

F.L. Masenya	Chief Health Inspector
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U.N.I.C.E.F

S. Kimaryo	Assistant Representative
R. Azhar	Project Officer
P. Seema	Assistant Programme Officer

ANNEX 4

LIST OF PERSONS MET

Ministry of Local Government and Lands

K.A. Selotlegeng	Senior Public Health Engineer
J.A. Gadek	Senior Public Health Engineer Advisor
R. Bowyer	Principal Finance Officer

Ministry of Health

J. Sibiya	Principal Community Health Officer
T.A. Pule	Chief Health Inspector
R. Mandevu	Chief Health Education Officer
M. Balosang	Senior Health Education Officer

U.N.I.C.E.F

S. Kimaryo	Assistant Representative
P. Seema	Assistant Programme Officer

S.I.D.A.

I. Lofstrom-Berg	Programme Officer.
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Kweneng District Council

S. Motse	Council Secretary
F.L. Masenya	Chief Health Inspector
B. Mmonatau	District Sanitation Coordinator
J. Letlhage	Village Sanitation Coordinator, Gabane
S. Mangwane	Village Sanitation Coordinator, Mmankgodi
K. Gabarongwe	Village Sanitation Coordinator, Thamaga
M. Letlole	Dep. Head, Matsaakgang Primary School, Mmankgodi

Central District Council

V.T.C. Matsoga	Chief Health Inspector
S. Setimela	Senior Health Education Officer
B. Regoeng	Health Assistant, Mahalapye Sub-district
B. Seme	Family Welfare Educator, Shoshong

Southern District Council

J. Maluleke	Health Inspector
V. Orapaleng	District Sanitation Coordinator
W. Mokotedi	Nursing Sister, Goodhope Health Centre
C. Bimbo	Community Health Nurse, Manyana
T. Mathiba	Enrolled Nurse, Manyana
T. Mosielele	Family Welfare Educator, Manyana
K. Ramhago	Family Welfare Educator, Manyana

Kgatleng District Council

G. T.C. Kokorwe	Council Secretary
R.T. Nthebolai	Deputy Council Secretary
G.R. Mogotsi	Deputy Treasurer
N.M. Mogomotsi	Matron
F. Molaletsi	Health Inspector
E.S. Dipate	District Sanitation Coordinator
D. Chuma	Village Sanitation Coordinator, Oodi
N. Rammoro	Village Sanitation Coordinator, Bokaa
P. Letsholo	Councillor, Malolwane
V. Kobedi	Family Welfare Educator, Malolwane





