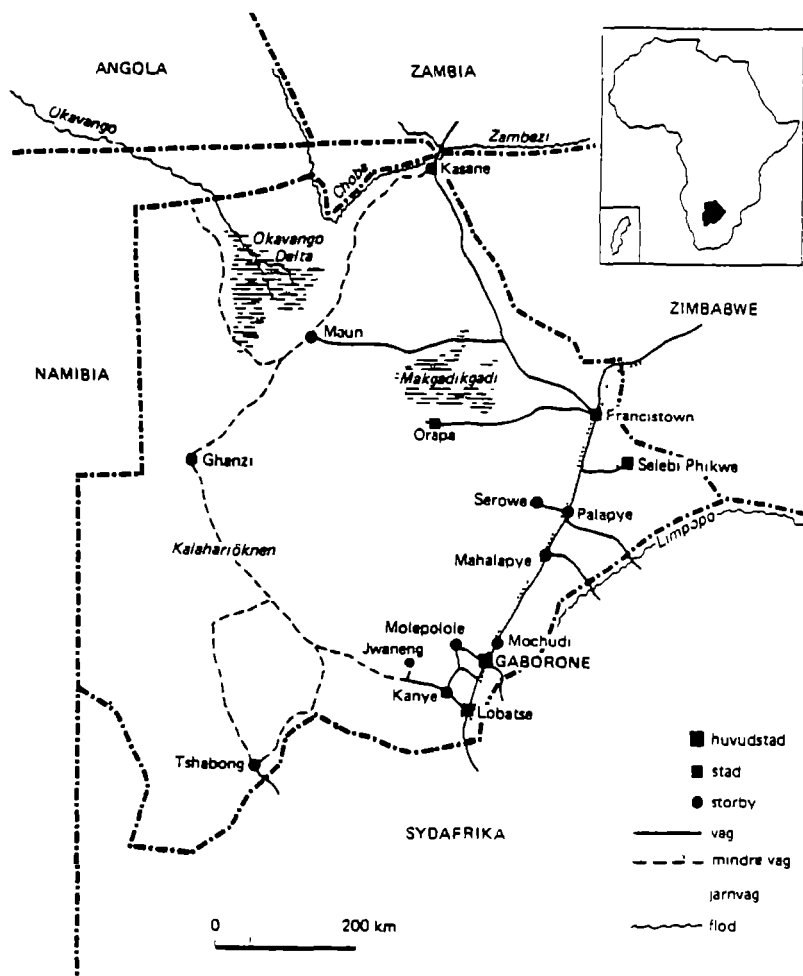


BOTSWANA

Evaluation of the village water programme

Final report

UNITARY
INTERNATIONAL REFERENCE CENTRE
FOR COMMUNITY WATER SUPPLY AND
SANITATION (IRC)



NOVEMBER 1988

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INTRODUCTION

The present Agreement for Swedish support to the Village Water Supply Programme in Botswana expires in June 1989. Botswana is likely to request a continued Swedish support to the Programme. As part of the preparations for a new agreement, SIDA commissioned a sector evaluation consultancy.

The evaluation was carried out during four weeks in September - October 1988. The evaluation team consisted of Mr Per-Olof Ahlberg, Swedish water engineer (team leader), Mr Jan-Olof Drangert, Swedish manpower planner, Mr Brian Egner, Mofswana Economist and Ms Gloria Somolekae, Mofswana social scientist.

The team spent their two first weeks on visits to some of the districts and villages which have been provided with water under the Programme. The remaining period was spent in Gaborone visiting ministries, training institutions, donors and other agencies involved in the water sector. The first draft Report was presented on 3rd October 1988. In this final report the views of all team members have been incorporated.

The evaluation team wishes to extend its gratitude to Botswana Government officers at Ministry of Local Government and Lands, Department of Water Affairs, Ministry of Health, District Councils in Maun, Kanye and Molopolole for their cooperation and assistance when conducting this task. The team is particularly grateful to Mr Richard White for help in obtaining background data for this report. Special thanks go to the officers of the SIDA office in Gaborone for arranging field visits, seminar and meetings.

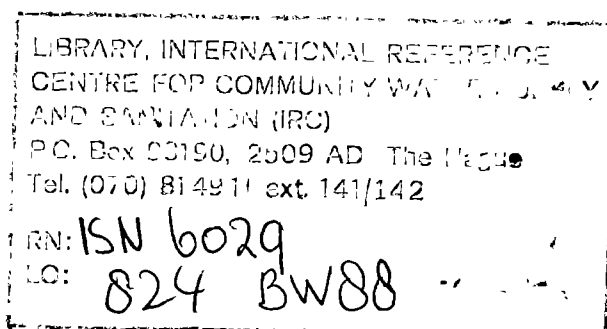


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ANNEX

Basic Education Requirements - Pensionable Staff

CHAPTER 1. EXECUTIVE SUMMARY AND LIST OF RECOMMENDATIONS1.1 Executive Summary

- 1.1.1 The progress of the VWSP has been satisfactory. Over the 16 year period 1972/88, 290 of 354 selected villages have been provided with water supplies; during 1984/88 (the period covered by this evaluation) 89 villages out of the originally targeted 98 were supplied, an achievement rate of 91 per cent.
- 1.1.2 The maintenance of the water supplies has been satisfactory. Breakdowns are usually repaired within a day or two.
- 1.1.3 The VWSP has been implemented for 17 years as a capital intensive high-technology programme with virtually no self-help participation from the communities. Government and council officers have not sufficiently involved the villagers in planning, implementation and maintenance activities.
- 1.1.4 Botswana's economy is prosperous and the Government in 1984/88 exceeded its agreed contribution of 30% for the VWSP, actually contributing 45% of the total capital funding. The recurrent funding, entirely provided by the GOB, has been generous and matches well with the increased maintenance requirements.
- 1.1.5 The criteria used in identifying villages which qualify for water supplies under the VWSP are vague and open-ended. It appears that the Government has no clear definition of what can be called a "village". In the absence of guidance about the minimum number of people to be served, there is no cut-off point at which it is judged uneconomic to install capital-intensive high technology reticulated water systems in even the smallest settlements.
- 1.1.6 The chain of responsibilities when selecting the villages and districts which are to receive a priority is also unclear. The capital funds are not controlled by the decision-making ministry (MLGL), but by the implementing one (MRWA). The key decisions appear to be made by district councillors who, because of the way the funds are allocated, are not responsible for the financial implications of their decisions.
- 1.1.7 The coordination between Water, Health and Sanitation is poor. The inter-agency responsibilities are unclear as DWA (and not MLGL) chairs the coordination meetings. There appears to be little acknowledgement

on the part of any central government agency of the undivided responsibility of council health departments for implementing the primary health care policy, including all aspects of sanitation and water hygiene, at the district level.

- 1.1.8 The privatization of the water sector is satisfactory. DWA plans to contract approximately 75% of its work to private companies, during the next two years, when there will be exceptionally heavy workload due to the backlogs under the Consolidated Emergency Water Supply Programme (CEWSP). Thereafter, it is planned that the use of private sector capacity will return to its more "normal" levels recorded in 1984/88.
- 1.1.9 The training programme run by ULGS for councils, and financed by SIDA under the District Development Support Sector (NDP Project No. LG55) is comprehensive and well-planned. It makes full use of the decentralised inputs of the councils themselves. The programme is correctly geared toward specific training aimed at improving the performance of tasks at the workplaces.
- 1.1.10 Implementation of comprehensive programmes for training of professional and senior technical personnel outside Botswana is well advanced. The need to employ expatriates in management posts in DWA, in MLGL, and in council water and sanitation departments is likely to disappear in the next five years.
- 1.1.11 If coordinated use were to be made of the district-level staff of DWA and of council water departments, the evaluation team believes it would become obvious that there is considerable overmanning and a surplus of industrial class workers in the rural public water sector.
- 1.1.12 MLGL intends to introduce a badly needed element of centrally-available transport planning and management advice for councils. Vehicle fleets appear to have grown in an unplanned, haphazard and opportunistic way for several years. Proper planning and management of council transport operations would almost certainly result in major savings of both capital and recurrent funds.
- 1.1.13 The indications are that future SIDA programmes should favour a water programme with simple technology and a sanitation programme which will be identified and implemented simultaneously with the water programme. Special emphasis should be given to water hygiene and water borne diseases and to activities which lead to more involvement of the communities. SIDA should

continue to support the augmentation of existing water supplies over the next four year period but this support should gradually be phased out and discontinued after 1992. SIDA should also support the preparation of the National Water Master Plan and the Lands Area Study; SIDA should not, however, become involved in financing the supply of water to arable lands areas until the complex issues related to the affordability of ever-smaller and less viable rural settlements in areas without basic social services have been fully resolved by the GOB in the context of the National Settlement Policy. SIDA technical assistance to MLGL should continue in 1988/92 at the same level as in 1984/88. As regards the technical assistance to DWA reference is made to the localisation plans of the Government of Botswana as reflected in the annual reports of the Presidential Commission on Localisation and Training.

1.2 List of Recommendations

- 1.2.1 Below is a summary of our recommendations. In front of each recommendation is the number of the paragraph in which it appears.

<u>Paragraph No.</u>	<u>Recommendation</u>
2.2.13	steps be taken to enable the community to participate at every stage of project development including siting, planning and construction of new installations
2.3.5	a more radical approach should be taken to community involvement; women's participation should not be taken for granted but carefully monitored
2.3.5	efforts should be made to involve more women in local and national policy making in the water sector
2.3.5	more women need to be involved in the operation of the water programme, not just as pumpers but also as engineers and technicians. Employment advertisements should call for applications from women, who may otherwise assume they will not be welcome.
4.1.2	the practice of using 16 year running totals in describing and planning the VWSP be abandoned

- 4.1.2 future planning targets should not specify how many "villages" are to be covered but should state how many "systems" are to be built and how many are to be rehabilitated in each project cycle, e.g. in VWSP VI for 1988-92
- 4.2.5 a costing exercise should be done in respect of DWA's drilling performance. Should such exercise confirm that DWA's activities are more expensive than those of private contractors, the drilling section of DWA should gradually reduce in size until what remains is one (or two) rigs for use in emergencies only.
- 4.4.3 if council water dept. transport fleets are to remain at their present size, total recurrent replacement provision for council vehicle fleets in future years should be increased from P2.48m to P7.5m
- 4.4.4 the maintenance and repair provision for 1989/90 should be calculated on the basis of 7.5% of capital value of the council vehicle fleets
- 4.4.5 councils should be enabled to use their savings on personal emoluments, not their spare parts votes, to hire private sector assistance with vehicle repairs
- 4.4.7 an expert in transport management/mechanical engineering be recruited by MLGL as soon as possible to advise councils
- 5.4.1 no new VWSP systems should be constructed until new criteria for location of VWSP systems have been developed.
- 5.5.3 the GOB should define what it means by the word "village"
- 5.5.3 new criteria for location and construction of water systems should be drawn up and promulgated by MLGL in consultation with the councils, DWA and, particularly, with the Department of Town and Regional Planning, which is responsible for implementation of the national settlement policy
- 5.6.1 all funds to pay for design, construction, rehabilitation and extension of council-

- owned water supplies under the VWSP should be warranted by MFDP to MLGL
- 5.7.2 the chairmanship of the IWSC should be held by a senior administrative officer of MLGL, the parent ministry of the councils
- 5.7.2 the secretariat duties of the IWSC and the responsibility for ensuring that its decisions are carried out should be delegated to the Senior Public Health Engineer (SPHE), MLGL
- 5.7.2 all concerned should be advised that the councils, specifically the District Medical Officers in their capacity as heads of council health and sanitation departments, are responsible at the district level for implementation of the government's policies in the fields of environmental sanitation and water hygiene
- 5.7.3 MLGL, the district development committees and the councils should take urgent steps toward meeting the need for better pollution control and for coordination of water/sanitation/hygiene operations at the village level
- 6.1.2 the training of small local contractors in latrine building, which has long been envisaged, should be begun without delay
- 6.7.1 no regular water quality tests should be done. Testing equipment shall only be used for controlling outbreaks of diarrhoea etc.
- 6.7.1 council health departments should ensure that the Water Hygiene Education Programme is implemented in all villages.
- 6.7.2 the council's health education staff should try to ensure that each small community elects a few people living close to the water source to look after environmental sanitation.
- 6.7.3 the protection and/or improvement of existing surface and temporary or seasonal water sources which are used by people should be included in the councils' coordinated small community water and sanitation programmes.

- 7.3.4 more use be made of small local contractors in constructing VWSP schemes.
- 8.3.3 maximum austerity in creating new industrial class posts in water departments and in recruiting replacements for upcoming vacancies, even though the new water schemes imply more work
- 9.2.3 groups of handpump caretakers/environmental volunteers should be trained in preventive health/ environmental sanitation measures and communication skills
- 9.2.3 all pumpers should be trained as soon as possible in accordance with the syllabus already prepared by ULGS
- 9.2.3 cooperative community relations aspect of the pumper's work should be more stressed in the pumper's course
- 9.3.3 the need to keep all staff fully informed about the context in which they work should be stressed in managerial training at all levels.
- 9.3.5 industrial class workers should be encouraged to develop skills in more than one field.
- 9.7.1 all training activities, especially for district staff, should be coordinated between DWA and ULGS, since it seems highly probable that many if not all DWA field staff will eventually be seconded/ transferred to work for councils
- 9.7.1 private sector staff should be invited to training programmes in order to improve their performance as contractors.
- 10.2.3 SIDA should in 1988-92 support such augmentation works as have been identified by DWA. SIDA's involvement in this work should, however, gradually be phased out and no support should be given for augmentation works after 1992.
- 10.3.5 SIDA funds be should used for construction of water supplies of simple technology (handpumps and open wells) in areas where

that technology is feasible. Such areas should be defined and the criteria presented to SIDA before funds are released.

- 10.3.5 SIDA should be informed of the ways in which development of water supplies is to be integrated with sanitation and health education at the village level
- 10.3.5 handpumps should be considered, and financed by SIDA funds under LG 56, as backups in areas where existing diesel systems are to be extended
- 10.4.3 a study should be conducted of the volume of envisaged civil engineering training needs and whether these can be met by the Diploma programmes.
- 10.4.3 SIDA should support Polytechnic to recruit teachers
- 10.5.6 SIDA officers responsible for recruitment of technical assistance personnel (TAPs) for Botswana should refer to the annual reports of The Presidential Commission on Localisation and Training, in which target dates for localisation of all TAP posts are specified
- 10.5.6 SIDA should continue to support MLGL with TAPs at the same level as today, with the possible addition of a transport manager/mechanical engineer should MLGL request a SIDA recruitment.
- 10.5.6 The need for a possible Coordinator for the Water, Health, and Sanitation SIDA Programme should be considered as SIDA's support changes direction towards small scale integrated water and sanitation facilities and training activities.
- 10.5.6 SIDA should consider supporting TAP at training institutions such as IDM and Polytechnic.
- 11.1.5 the proposed new tariffs for private water connections should be implemented as soon as possible
- 11.1.5 SIDA should support the preparation of the National Water Master Plan

11.3.1 SIDA funds should be made available for the Lands Area Study

11.3.1 SIDA should not become involved in financing the supply of water to arable lands areas until the complex issues relating to the affordability of ever-smaller and less viable settlements in areas without basic social services have been resolved by the GOB in the context of National Settlement Policy.

CHAPTER 2. PROJECT BACKGROUND

2.1. The Botswana Economy

2.1.1. From being one of the poorest countries in the world at the time of independence in 1966, Botswana now has one of the most rapidly growing economies in the world, with a per capita national income which places it in the World Bank's middle income category. In the past 20 years, GDP has grown eight-fold, and, despite an exceptionally rapid rate of population growth, GDP per capita has risen substantially from about P50 to over P300 today.

2.1.2. Among the factors contributing to Botswana's success have been its political stability, the continuity of leadership, the government's disciplined approach to economic management, and the financial and technical assistance received from international and bilateral donor sources. However, democratic institutions, good government and generous donor support do not themselves create jobs and wealth. Botswana's rapid and sustained growth since independence is due to the existence of diamonds, copper-nickel and coal, and to very substantial foreign private investment in the development of the mining sector. Membership of the Southern African Customs Union has enhanced the impact of mining investments on Government revenues and enlarged the rapidly growing pool of mining-derived fiscal resources available to the public sector. Prudent deployment of these resources by the public sector has in turn stimulated other economic activities and attracted more private investment. Thus the secondary and tertiary effects of the initial mining investments and subsequent expansion of mining have contributed to Botswana's accelerating economic growth. The public and service sectors grew rapidly from 1970 onwards. A substantial proportion of foreign investment in Botswana has come from neighbouring countries; and to date Botswana has benefited more from disinvestment in Zimbabwe and Zambia than it has from disinvestment in South Africa.

2.1.3. The economy of Botswana is still healthy with high growth rates, rising average per capita incomes, and large and rising trade surpluses, foreign exchange reserves and government cash balances. However, as pointed out by the Governor of the Bank of Botswana, Mr H.C.L. Hermans, in a recent policy address, there are problems which must soon be tackled.

2.1.4. First, diamond production now accounts for nearly 50% of GDP. In 1987, diamond sales contributed over 90% of total export earnings and more than two-thirds of Government revenue. Botswana has virtually become a one-commodity exporter, heavily dependent on a potentially volatile international market for its future prosperity.

2.1.5. The second major problem, according to Mr Hermans, is the stagnation of the rural economy. Rural production has been declining, not just in relation to total GDP, but also in absolute terms. There is some evidence that the ecological decline of many marginal range and arable areas may be irreversible, resulting in a permanent fall in carrying capacity and crop yields. The long-term prospects for agriculture and livestock production in Botswana are not promising. Most economists, including those at the Bank of Botswana, now agree that the best that can realistically be hoped is for rural production to continue to support about the same number of people as it does at present, albeit at income and welfare levels below the national average. At present population growth rates, that implies a steadily increasing flow of rural migrants to the larger towns where manufacturing or service industries, if not the Government itself, offer some prospect of wage employment.

2.1.6. The third major problem, identified by the Bank of Botswana, is the rate of population growth and its impact on Botswana's longer-term economic prospects. The 1987 World Bank Atlas lists Botswana as having the sixth highest population growth rate for the period 1973-85 among all countries with more than one million people, and the 17th highest fertility rate in the world. The situation is even worse than these rankings suggest: four of the countries with higher population growth rates are Gulf states with high annual inward immigration rates. With a population growth rate approaching 4% per year and an average of between six and seven live children born to every female of child-bearing age, the expansion of population in Botswana is close to human biological limits. Only the Government and people of Botswana can solve the population problem. But if the present wholly unsustainable rate of population growth is not significantly reduced, Botswana's long term economic prospects, with or without foreign investment, are dismal.

2.1.7. A broad consensus exists in Botswana, reflected in official statements as well as in the Mid-Term Review of NDP 6 and in the private sector, that the era of diamond-driven economic expansion is almost over and that the Government and the country must adjust to new economic realities. The Bank of Botswana has been portraying 1987 as a watershed year in the modern economic history of Botswana and predicting a progressive decline in the rate of economic growth thereafter. This claim is predicated on three assumptions.

2.1.8. First, it is assumed that, with the Jwaneng mine having reached its full productive capacity and with the diamond stockpile having been disposed of, no further significant increases in the contribution of diamonds to GDP can be anticipated from the existing diamond mines in Botswana, unless international diamond prices rise appreciably faster than the rate of domestic inflation.

2.1.9. Second, it is considered unlikely that new diamond mines will be developed in Botswana for many years to come. Already the third largest diamond producer in the world in volume terms, Botswana's share of the world's diamond market is sufficiently large (and its population sufficiently small) that any plans to expand production in Botswana on a major scale would be bound to attract the attention of other diamond producing countries and could even affect diamond prices internationally.

2.1.10. The third assumption is that no other mining project currently in prospect will have an economic impact in the next ten years comparable to that of Orapa, Lethlakane or Jwaneng in the past fifteen years.

2.1.11. Senior officials in the Ministry of Finance and Development Planning predict that the annual rate of growth of the Botswana economy will decline from about 11% in 1987 to about 4% from 1992 onward. The officials generally agree with the view of the bank of Botswana that the very high growth rates of the past fifteen years are unlikely to be repeated in this century. Although the real rate of economic growth is still expected slightly to exceed the rate of population growth.

2.2 Community Participation

2.2.1. The Government of Botswana has time and again reiterated its commitment to ensuring that people are involved in development efforts. Government believes, and rightly so, that efforts involving people have greater chances of success and long-term sustainability. The current National Development Plan (1985-91) for example states that:

"... decentralization of decision-making in the districts should continue to be emphasized with the accent on greater participation of the people in both planning and implementing developments"

The same goal is shared by SIDA. In particular, the SIDA Water Strategy document categorically states that:

"The initiatives and 'participation' of the people are also required... preferably the projects should come from the initiatives, needs and priorities of the local population."

2.2.2. Botswana has now made some remarkable progress in creating the necessary institutional machinery for effecting this popular participation. This is particularly true at district level, where institutions such as the District Development Committee (DDC), local councils, etc., exist to give community participation meaning and content. Of equal significance are the village institutions such as health committees, the kgotla, Village Development Committees (VDC), etc. These are aimed at facilitating community participation at village level.

2.2.3. However, the general feeling in government is that far too little is being achieved in involving local people in both the planning and implementation of development programmes. Therefore, the issue has been, and continues to be a subject of debate at such meetings as for example, the 1985 Kanye Workshop on The Theory and Practice of Peoples' Participation in Rural Development, and later in 1986, the 13th National District Development Conference on Peoples' Participation in Development.

2.2.4. The meetings have identified several barriers to community participation such as, for example, the weak organizational structures both at the district and village levels, lacking the capacity to carry out their functions; personnel problems, political factors as well as socio-economic factors such as settlement patterns, migration and drought. It is reasonable to expect that the Water Hygiene and Sanitation programme is also affected by problems already identified. We observed especially in the water sector that there is very little community participation. It is probably beyond the scope of this report at this stage given the limited time available, to spell out the exact nature and extent of the community participation that could be considered as sufficient by both the Botswana Government and SIDA. Suffice it to state though that at this stage there does not seem to be a clear cut and well defined policy on the involvement of the community in the water sector. As will be shown later, the need for laying out such a policy is long overdue especially in light of the obvious need to avoid unnecessary confusion, inertia, and to ensure that those formally charged with the task of ensuring that this participation takes place, do not leave it to chance, or take it for granted.

2.2.5. While participation in planning, construction and upkeep of the installations is seen as a precondition for the installation to function, not much is stated on the Botswana Government side concerning at least what the community should do or where exactly it must come in. Thus, as a matter of practice, the Department of Water Affairs (DWA) drills boreholes in areas which qualify for such a service according to council criteria.

2.2.6. The consultative machinery at village level, namely the kgotla, and VDC is supposed to advise council in a situation where villagers have expressed a need for a reticulated water supply system. Community needs are then submitted to council where they are later forwarded to the ministry of the local government and lands. After this ministry has processed such needs and prioritized them, the sitting process begins.

This is normally expected to involve a village leader such as a councillor, a chief or a VDC chairman. Although this is strictly not a community exercise, we have been informed of instances where the site has been changed because of a community request. It is also apparent that some village leaders have used their influence to ensure that a certain site, not

necessarily one preferred by the community, is chosen. This underlines the fact that the process is quite informal, sometimes elitist, has sometimes lent itself to abuse. Once drilling and equipping starts, only technical personnel of DWA are involved. The community only takes part in trenching, though not on self-help basis. They are paid for it.

2.2.7. The maintenance and upkeep of the water scheme is handed over to the councils. Contrary to what SIDA may expect, the community has almost no input in the exercise. Nowhere did the team come across cases where the community was involved at least in the maintenance of the water schemes, except for the fact that the community selected a pumper through the VDC and had to fence the areas around the standpipes. This non-involvement in the water sector could be one of the reasons why the problem of water bacterial contamination was noted to be prevalent in some areas.

2.2.8. Surely it is not too late to involve the community. This would be particularly true in smaller villages and scattered settlements without water systems provided by the Government. We believe government should start here. This should not be misunderstood to mean that we expect the task to be easy. It is obviously difficult especially because of the impact of programmes such as drought relief and the forthcoming arrangement where members of VDC's are going to be paid monthly sitting allowances. Such concessions, undoubtedly, can have the cumulative effect of slowly eroding the self-help spirit that was there in the past. In the water sector, it is important to note that MOA's popular ARAP programme may kill any community efforts in this area, because it provides a number of subsidies, among which it effectively provides people in land areas with free water. Thus, those responsible for working out the modalities of community participation in the water sector have to take into account the various subsidy programmes which work out in the opposite direction.

2.2.9. An area where there is some amount of community participation is the Environmental Sanitation Project where, at both the individual and community level, participation is ensured in several ways. Firstly, Community Development Officers (CDO), nurses, Family Welfare Educators, VDCs and health committees play some role. The kgotla mainly is used to introduce the project to the community. The purpose and operation of the project is explained to the people. Then demonstration latrines are set up in the village at sites selected by the community. Usually a seminar is later held where both project staff and villagers discuss the operation and maintenance of the sanitation facilities.

2.2.10. An individual requiring a latrine at his/her household is expected to contribute both materially (i.e. money), labour and time. He/she digs the pit. This could be one of the key reasons why in most villages where this project has been tried,

the community response has been noted to be quite impressive. No doubt, the demonstration component of this project helps the community to understand as well as to immediately enjoy the expected benefits. On the other hand, the nature of this project itself, that its benefits are clearly visible and the new capital asset can be exclusively enjoyed by the individual household, is an added advantage to the project worth noting. This is not necessarily the case with the water programme where although private connections can ensure exclusive benefits to the individual households, the same is not true of public standpipes.

2.2.11. A positive and encouraging lesson to be learnt from the sanitation project is that community participation is both necessary and possible. This is particularly the case where the community believes that the project will address their immediate felt needs. As one woman informed us in Matlapaneng, they had previously had to walk long distances in order to relieve themselves. This, she said, took a lot of time and was sometimes a difficult exercise, more especially at night. She was quick to note the difference now that the latrine was close to the household. She and those with her, felt it had been a very welcome development in the village.

2.2.12. There is no doubt that the provision of water must be seen as a welcome step and also as addressing a felt need. This is to be expected because in almost all consultative meetings held in Botswana since independence, water has continued to rank high among the priorities of the rural communities. Thus, the water programme is one which addresses a problem that rural communities regard as important.

2.2.13. Experience from other developing countries, notably South East Asia and Kenya, teaches us that water installations which are planned and implemented with very little or no community participation, are not sustainable and usually have a short life-span. The consumers tend to lack a sense of responsibility for the facility and its quality of operation generally deteriorates with time. In line with the Botswana Government's commitment to promoting self-reliance and in recognition of what SIDA is trying to achieve here, this is not be encouraged as it undermines a very important national principle. The evaluation team recommends that steps be taken to enable the community to participate in making choices at every stage of project development including siting, of location of source planning and construction of new installations.

2.2.14. Community participation should also be sought in the maintenance of such water schemes. This calls for some contribution from the community, whether finance, time or labour. To most people, the idea of the community contributing some financial resources may appear to be unrealistic, insensitive and inconsiderate. Those regarding such a suggestion as unrealistic may point to the extent of rural poverty in the

country especially in remoter areas which constitute a special target group in SIDA's water supply strategy. Thus the view would be that such rural communities lack the ability to pay for social services. On the other hand, given the present healthy state of the Botswana economy already alluded to above, a suggestion that Botswana's rural communities must make some material contribution may appear to be irrelevant and uncalled for especially in the short-term. However, there are two points worth noting here. Firstly, it is not always necessary that the contribution of the poor should only be financial. As Biscoe and de Ferranti (1988) rightly argue,

"... the worst possible approach is to see poor people as having no resources There can be no escaping of the fact that the severely resource-constrained conditions that most developing countries will continue to face decades ahead, the best resource available to people in underdeveloped communities is themselves There must be an awareness, in short, that local people are their own best asset and their own most promising mechanism for bringing about change."

2.2.15. This means that people can contribute their labour and time to plan, execute and maintain such projects. Seeing local people as incapable of making some contribution encourages a "top-down" approach to development, but such an approach is not in line with either the Botswana Government's goals or SIDA's. This needs to be looked into more and modalities have to be worked out for ensuring community participation in the water programme. Moreover, there is evidence to suggest that Botswana's economy will not continue to grow at present rates. Sooner or later, this reality may have to be lived up to. As pointed out, this is more long-term than immediate and has to be carefully considered by both parties involved.

2.2.16. In any discussion and/or practice of community participation, it is very important that those involved have the same understanding of what they are expected to do. The current concerns, at least as gathered from some informal discussions held with people involved at various levels, suggest that this is not the case. In fact, even the concept of community is not quite clear to all. Given the magnitude and character of all types of changes that have taken place in this country over the past decades, the concept itself may have to be revised.

2.2.17. A 'community' can be understood in two senses. First as a group of people sharing socio-cultural and political interests and also geographically, as "embracing all the individuals living in a village, rural district or urban suburb. The members recognise reciprocal social obligations to each other, hold common values, and identify themselves with each other as 'we'". This ideal type of a community is almost impossible to find nowadays. Factors such as migration, urbanisation, etc. have transformed and substantially altered the original complexion of communities. This is particularly true in big villages and

towns. The implications of this for community participation are significant. Practice so far shows for example that community participation is much easier to achieve in smaller communities than bigger ones. This makes it mandatory for anybody planning community participation to be aware of what is possible under what circumstances so as to ensure that the plan is realistic. In this way it is imperative to realise that some of the traditional ingredients of community participation such as strong traditional leadership are now lacking. Thus we agree with Molutsi (1987) that "for future purposes, community participation should be carefully monitored rather than taken for granted ... it must be based on revised premises and more appropriate methods of inducing support".

2.2.18. The very notion of community participation is not so obvious. The concept is generally understood in three ways. First as meaning consultation. Here those with decision-making responsibility consult the community on matters affecting them, to seek advice. Secondly, it may mean "control". This is where the local community is encouraged to take charge of all matters affecting it, whether political or economic, as a matter of right. It may also mean informing people about what has been decided and how such decisions are to affect them.

2.2.19. In the water sector, community participation needs to be understood in a much broader context. The people need not only to be informed, or consulted, but they ought to have some contribution, be it material or in kind. In addition, they have to be involved throughout all stages of project development. The 'how' part will have to be worked out, and here the experience from the sanitation project may provide a starting point. Such participation will obviously be determined by several factors such as the nature and scale of the project itself, the size and composition of the community, the organizational skills available, etc. What is perhaps worth noting is that "in order for community participation to work, projects must include special components addressing it ... The cost of organizing community participation should be included in the basic cost of the project". As already indicated, this is no simple matter but experience from projects in other countries and Botswana itself show that this is not an unrealistic expectation.

2.3 Women and the Water Sector

2.3.1 In most developing countries, women and children constitute a large majority of the people who fetch and use water. In these societies, women play several roles such as cooking, cleaning, farming, food processing, child care, etc. Few of these activities would be possible without water. Botswana is no exception to this. Women's traditional and cultural responsibilities demand that they carry water, sometimes over long distances, and use it. It is therefore not an overstatement to argue that if there are any benefits to be derived from the village water supply programme, they will be

enjoyed by women. The Richard White "Socio-Economic Impact Study" highlights some of the benefits that Batswana women have enjoyed as a result of the village water supply programme. These include reduced walking distances to fetch water and time saving. Now that clean and safe water is available to quite a significant proportion of the rural population, women can have more time to spare for other demanding tasks within the household. It is not farfetched to expect the general quality of work within the household to improve as a result of the availability of safe and clean water.

2.3.2 This is particularly important in a context such as the Botswana one where 52,0% of the de facto population is female. Female headed households in rural Botswana constitute 48% of total rural households. There is no doubt then, that the clean and relatively safe water now available benefits women more than anybody. Due to this, women can be expected to have an immediate interest in the village water programme. They are the major target group. However, although this is so, and despite the fact that carrying and using water is largely a women's role, women generally tend to be excluded from decision-making, including that dealing with water. This is not government policy, but a result of socio-cultural practices which society has held for generations encouraging women to see their place only inside the home and not in the leadership arena. Thus even in locally powerful bodies such as district councils, operating largely among women, they still do not hold key political positions in large numbers. This is the rule in all councils throughout the country. In the administrative and technical spheres, the story is the same. While there are very few women pumpers generally in the country, their number is almost nil when one examines the key technical positions in the water sector such as those of water engineers and technicians. For example, while the total number of males employed in the electrical and water activities in 1983 was 1,862, the figure was only 68 for women.

2.3.3 There is no doubt that if there is to be any community participation in the water sector, the special role and circumstances of women have to be recognized. In particular, the following need to be noted:

- (a) water projects largely benefit women, and community participation in the water sector means women's participation;
- (b) due to their special circumstances, women constitute the poorest of the poor in rural areas. This is even more true of those heading their own households. Studies have shown that they lack the major means of production such as draught power or labour. Hence their contribution will have to be assessed and determined on the basis of what they are only capable of providing - probably time;

- (c) although a network of district and village institutions is already in place to facilitate community participation, their potential to do this should not be taken for granted but fully monitored and investigated. This is because some institutions, such as the kgotla, traditionally excluded women. Although such discrimination is no longer sanctioned, attitudes and customs persist, and these could serve as undercurrents frustrating all community participation efforts which do not seem to recognize existing reality.

2.3.4 As noted in the health section, a relationship is to be expected between availability of clean and safe water on the one hand and improved health. The issue of water quality has been discussed. It is critical to realize that most of the water contamination that takes place after the water has left the standpipes is largely due to the way women handle it. Thus it is encouraging to note that the village sanitation programme recognises this and tries to reach water users within their households. Chances are quite high here for the success of such household-to-household efforts because a woman's life in Botswana, centres around the home. Therefore, already, the focus is on women and we feel that although men should also continue to be educated about water and sanitation as well, women should continue to constitute the primary target group. Women play a crucial role in the primary health care delivery system in Botswana. Apart from the fact that they constitute about 90% of the labour force in this sector, they play a crucial role especially at the levels of identification of health problems, as well as the setting of health priorities for planning purposes. Although they still play a limited role at policymaking level, their keen participation in the implementation stage is enough evidence of their increased participation. This experience from the health sector, should form a basis for planning women's participation in the water sector. The experience is testimony to the fact that the potential is enormous. It is not farfetched actually to state that the improvements in family health have been largely due to the increased participation of women.

2.3.5 Our recommendations with regard to women's involvement in the water sector are:-

- (a) There is a need for a more radical approach to community involvement, and women's participation should not to be taken for granted but carefully monitored.
- (b) Efforts should be made to involve more women in local and national policy making in the water sector.

- (c) More women should be encouraged to be involved in the operation of the water programme, not just as pumpers but also as engineers and technicians. Employment advertisements should call for applications from women, who may otherwise assume they will not be welcome.

2.4. Description and Appraisal of the Village Water Supply Programme (VWSP) 1984-88

2.4.1. The series of SIDA-financed rural water supply programmes in Botswana began in 1971 with construction by the Department of Water Affairs (DWA) of water supplies in 17 major villages with between 4,000 and 30,000 people in each village. Subsequent programmes covered medium and then smaller and smaller-sized settlements. By June 1988 the cumulative 16 year figures kept by DWA showed that 273 water systems built under the SIDA-financed programmes had supplied 282 rural villages, in which lived some 283,000 people or about 30% per cent of the 1988 rural population of 958,000, with potable water. A further 250,000 people, or about 26% of the rural population, are served by the Major Village Water Supplies.

2.4.2. At the end of the fourth VWSP, 1980/84, SIDA decided that the major village schemes were no longer eligible for SIDA funding. Other donors have since 1984 been requested to fund the schemes (WB14, WB37) for upgrading the major village water supplies built by DWA with SIDA funds and technical assistance in the 1970s. The estimated cost in 1987/91 of the major village exercise (WB37) is P56 million at 1987/88 values. Funding will come from KFW, P19m; DDF, P33m; EEC P4.4m.

2.4.3. In 1988 work had begun on constructing 68 water systems covering a further 72 villages during VWSP VI, 1988-92. The 1988 total estimated population of these settlements was 27,000, an average of 380 people per village (highest 1230, lowest 25); completion of these supplies in 1988-92 will add less than 10 per cent to the total number of people served by the VWSP in 1988. The capital cost per water supply was estimated at P248,000 in 1988. Of these 68 systems, 15 have a high priority under the Consolidated Emergency Water Programme (CWEP) and will be built in 1988/89.

2.4.4. Other plans have been made from 1985 onwards to cope with the large volume of expensive rehabilitation, upgrading and expansion work which is being called for as a result of rapid population growth and rising public expectations in the villages, including major villages, whose water systems were built under VWSP in the 1970s and are now running at or beyond full capacity. Fifty-four existing systems covering 60 villages are scheduled for rehabilitation/augmentation in VWSP VI 1988-92.

2.4.5. During VWSP V 1984/88 a need emerged for rationalisation and for choices to be made between the resource demands which

are articulated by the district councils for (a) creating new supplies in ever-smaller villages and (b) rehabilitating and augmenting existing supplies. Rehabilitation and augmentation work have been given first priority by councils, MLGL and DWA, and this has led to a reduced number of new water supply systems.

2.4.6. With the dropping of the major village component of the SIDA programme in 1984, the three elements of VSWP V 1984/88 (the subject of the present evaluation) were defined as:

- (a) Village Water Supplies Programme (VWSP)
(Ministry of Mineral Resources and Water Affairs, Dept. of Water Affairs, NDP Project No. WB42)
- (b) Operation and Maintenance of VWSP
(Ministry of Local Govt. and Lands
District Councils, NDP Project No. LG56)
- (c) Water Health Education Sanitation Programme
(Ministry of Health, District Councils, NDP Project No. MD32)

2.5 Socio-Economic Impact

2.5.1. The evaluation team was introduced to a study on "Socio Economic Effects of Village Water Supplies in Botswana" by Natural Resource Services (Pty) Ltd. The aim of the study was to assist the evaluation team by providing an assessment of the socio-economic impact of the village water supply programme. Ten villages throughout the country were evaluated. The major thrust of the study is that the programme VWSP has largely performed satisfactorily. In this regard, the report points to benefits such as time saving, improved health, reduced walking distance to water point and of course the fact that reticulated water is now available to a large part of the rural population.

2.5.2 The study highlights several problems with the programme. Some of these are supply failures and shortages of water not only resulting from mechanical breakdowns but from poor administration which manifests itself in several ways including the failure to augment storage or production capacity in a timely manner. Secondly, the study acknowledges the fact that although the operation and maintenance of the schemes have improved, a lot remains to be done especially in the areas of personnel training and better record keeping.

2.5.3. The reticulated water supply systems have naturally had great impact on the villages. Below are some of the major findings of the study:

- Water in larger quantity: The average daily consumption was estimated at 20 l/person. This is a substantial increase

compared to when no water supply was available. 27 % of the consumers take water outside the village to the lands.

- Shorter walking distance: 48 % of the consumers fetch their water within a distance of 200 meters from the standpipe. 63 % of the women reported time saving.

- Economic activities: 36 % of the consumers use the water for some economic activities.

- Water of better quality: 90 % of the consumers were handling their water in an unsatisfactory manner. Only 10 % did not contaminate the water before using it.

2.5.4. Following these findings, the study presents some recommendations. Unfortunately, it is quite obvious that the study was conducted under time pressure and as a result, some of what could be the major findings are not adequately backed with relevant data. An example is the alleged correlation between improved health and the implementation of the VWSP. The casual relationship between the two remains unclear given the several factors also at play in the districts, such as improved literacy etc.

2.5.5 It is, however, clear that the water supply programme has had significant impact on the villagers where systems have been constructed. The evaluation team draws the following conclusions from the study:

- The VWSP has improved the living conditions for the rural population. The women, the traditional providers of water, are the main beneficiary. Shorter walking distance has given them time for other duties.

- The VWSP has also had some impact on the economic activities in the village. A good number of people are now involved in beer brewing and brick making, activities, which would be impossible to carry out without the water supply.

CHAPTER 3. FINANCE3.1. Capital Funding of VWSP V, 1984-88

3.1.1. According to the GOB Project Reviews for 1984 and 1987, SIDA funds disbursed in 1984/88 were as follows:-

<u>P'000 at 1987/88 values</u>	<u>1984/85</u>	<u>85/86</u>	<u>86/87</u>	<u>87/88 (est)</u>	<u>Total (est)</u>
(a) VWSP (DWA, WB42)	3000	4200	7000	5134	19 334
(b) Operation & Maintn. of VWSP (MLGL/Councils, LG 56)	678	1106	211	2251	4 246
(c) Water Health Ed. (MOH/Councils MD32)	-	7	60	90	157
	<u>3678</u>	<u>5313</u>	<u>7271</u>	<u>7475</u>	<u>23 737</u>

3.1.2. DWA spent a total of about P36.6m at 1987/88 prices on WB42 projects for construction, rehabilitation and extension of rural village water supplies on behalf of councils during VWSP V 1984/88. A breakdown of the contributing agencies appears below:

<u>Agency</u>	<u>Contribution (Pula)</u>	<u>Percent of Total</u>
SIDA	19.300.000	52.7
DDF	9.200.000	25.1
DDF (drought relief)	6.800.000	18.6
UK aid	720.000	2.0
Netherlands	60.000	0.15
UNDP	18.000	0.05
LWF	480.000	1.3
Rotary International	<u>41.000</u>	<u>0.1</u>
	<u>36.619.000</u>	<u>100.00</u>

3.1.3. Capital expenditure in 1984/88 by the district councils under NDP Project LG56 amounted to P9.2m at 1987/88 prices. The funds were spent on rehabilitation of existing supplies and on increasing the councils' capacity to operate and maintain water supplies through improvements in infrastructure and purchases of additional equipment and transport. A breakdown appears below:

<u>Agency</u>	<u>Contribution (Pula)</u>	<u>Percent of Total</u>
SIDA	4,250.000	46
DDF (drought relief)	<u>4.950.000</u>	<u>54</u>
	<u>9.200.000</u>	<u>100</u>

3.1.4. Capital expenditure by the Ministry of Health on the third item of VWSP V, Water Health Education, NDP Project MD 32, was P157,000 at 1987/88 values, all of which was provided by SIDA.

3.1.5. Summarising the capital funding of VWSP V 1984/88, total expenditure amounted to P46 million at 1987/88 values, of which P23.7m or 52% came from SIDA; P21m (45%) from Botswana DDF; and P1.3m (3%) from the various other donors listed above. The original programme agreement specified that 30% of capital funding should come from the GOB, which in fact exceeded its commitment by providing 45 per cent.

3.2. Recurrent Costs and Revenues of VWSP V 1984-88

3.2.1. According to the District Councils and Land Boards Budgets for 1988-89 the estimated recurrent costs of maintaining and operating the approximately 273 council-owned rural village water supplies will amount this year to P5.5m, or 8.4% of the councils' total estimated expenditure of P65.4m. Council expenditure is only a small part of the annual recurrent expenditure of the GOB: thus, the P5.5m cost of council water supplies in 1988/89 amounts to only 0.32 per cent of the GOB's 1988/89 budgeted expenditure of P1711m.

3.2.2. The district councils expect to collect revenue of P232,910 from the sale of water in 1988/89. Of this amount, P133,500 is for cattle watering fees and P99,410 for supplying water to households with private piped connections. Standpipe water for human consumption is, as a matter of policy, regarded as a social service and provided free. The estimated revenue of P232,910 amounts to 4.2% of the P5.5m estimated expenditure of the councils on running their water supplies in 1988/89.

3.2.3. As for the per capita recurrent costs and benefits of operating the 273 rural village water supplies, it was estimated by the SIDA consultants Natural Resources Services (Pty) Ltd that in August 1988 these schemes were serving about 283,500 people; no reliable figures are available but the same consultants estimated in 1988 that each person was consuming an average of 21 litres of water a day. The average net direct per capita recurrent cost (subsidy) of supplying water in the rural villages in 1988/89 is P18.58 a year per person or P120 p.a. for an average household of 6.5 persons.

3.2.4. This figure however, contains no provision for transport costs, centrally budgeted administrative services, assistance from other council departments, DWA and MLGL, and depreciation of facilities which at 1988/89 prices (P240,000 per new water supply in villages with under 1000 people) probably have a capital value of over P100m. If realistic budgetary provision were to be made for the items which have been omitted, particularly for depreciation, the average per capita recurrent subsidy on rural village water supplies would be at least P50 a year, or P325 for an average household of 6.5 persons.

3.2.5. Even then it should be borne in mind that in normal circumstances the larger villages will have lower per capita costs which will tend to bring down the average rural level. In

the smaller and remoter villages, however, such as those which were equipped by DWA in 1984/88, the recurrent and capital costs of supplying one person with water will far exceed the rural average.

3.2.6. A rising trend in the level of average real per capita recurrent costs is to be expected in view both of rapid population growth and of the VWSP's acceptance to date of an open-ended commitment to supply smaller and smaller villages with water. There is some evidence of this trend in the figures showing the amount of recurrent funds provided by MLGL to the councils for maintenance and operation of village water supplies during VWSP V 1984/88. The rate of increase in the recurrent funding appears to have more than kept pace with both population growth and the increased number of new facilities and people brought into the rural water supply network for the first time. A 26% increase in the population served (from 224,310 in 1984 to 283,500 in 1988) was met by a 30% increase in recurrent expenditure at constant 1984/85 prices; it appears that there was a three percent increase in average per capita spending in real terms on the operation and maintenance of rural village water supplies in 1984/88.

CHAPTER 4. FINDINGS OF VWSP V 1984 - 88 OPERATIONS

4.1. VWSP V Targets and Achievements 1984-88

4.1.1. An examination by Natural Resource Services Ltd of various documents and records compiled by DWA, MRWA and MFDPA indicates that by September 1984 DWA had adopted a scaled-down running target of supplying 98 villages in the four-year period 1984-88, which is the subject of the present evaluation. By June 1988 DWA had completed construction of 85 systems covering 89 villages, a completion rate in terms of villages of 91 per cent. During the same period, DWA, which had many unforeseen calls upon its resources due to the drought, completed the urgent major rehabilitation of five existing VWSP systems covering six villages; this further enhanced what must be judged a very creditable performance during VWSP V 1984/88.

4.1.2. The evaluation team had great difficulty in working out the numbers of water systems actually built since 1972 and even from 1984 to 1988. No real accuracy would be attainable without combing through records (some of which are non-existent) for a period of 16 years. The practice of using running totals covering a period of 16 years presents many opportunities for error. Confusion is also caused by the practice of referring to the number of "villages" served by VWSP water systems rather than the number of systems actually built. The two are by no means the same, since one system frequently serves two or even three adjacent 'villages'. We recommend that the practice of using 16 year running totals be abandoned and we further recommend that future planning targets specify how many "systems" are to be built and how many are to be rehabilitated in each project cycle e.g. in VWSP VI for 1988-92.

4.2 Performance of DWA (Construction)

As a whole, the achievements have been quite satisfactory. The five-year drought has obviously slowed down the implementation rate. To date a total of 290 water systems have been completed and a rural population of approximately 283.000 is benefitting from improved water supplies.

4.2.2. Siting of boreholes was previously done by DWA staff only. This has changed over the past six months and DWA now contracts most of its work to private companies. As at today 75% of all siting is to be done by the private sector. The success rate (wet boreholes - total number of boreholes drilled) has been approximately 50 % over the past years. Approximately 75% of all boreholes drilled under the VWSP are now being drilled by private contractors. Tenders of usually between 20 and 40 boreholes have been advertised and awarded under one contract. DWA has restricted itself to seven relatively large local contractors with rotary rigs. The reason for this has been the urgency with which the boreholes have been required. The unit

cost for a borehole drilled by a private contractor to a depth of 100 meters (including all costs such as casing, transport, establishment etc.) is on average P 11.000.

4.2.3. DWA has also used its own drilling rigs (7 rotary and 11 cable tool rigs) to implement the VWSP. The comparative unit cost of the boreholes drilled by DWA could not be made available. As the accounting procedures at DWA appear to be very poor, it was not possible to obtain any project costs or any cost on, for example, drilling. We (the evaluation team) did not have time to sit down and assess the cost. The general feeling among the staff of DWA was, however, that "in-house" drilling by DWA is far more expensive than drilling by a private contractor.

4.2.4 The achievements during the past two years appear below:

<u>Financial year</u>	<u>Drilled by</u>	<u>No. of Boreholes</u>	<u>Meterage</u>
1986/87	DWA	149 (80 successful)	16,899
1986/87	Private Contractor	61 (41 successful)	10,438
1987/88	DWA	108 (64 successful)	15,647
1987/88	Private Contractor	20 (17 successful)	1,659

The poor performance of DWA's drilling fleet is remarkable. Information from two private drilling contractors indicated that the annual meterage (15,000 metres) should normally be achieved by only one rotary rig. Furthermore this output tallies with what the Ministry of Energy and Water Resources and Development in Zimbabwe achieved when drilling with a rotary rig under similar geological circumstances. The low output and the high cost is mainly due to inefficiency and poor management of the DWA drilling crew. There is a lack of planning when undertaking the drilling activities. Furthermore, there is no incentive for the DWA's drilling crew to work hard. All private drilling contractors give special bonuses to their staff for good performance. There is no such carrot for DWA's drilling crew.

4.2.5. We recommend that a costing exercise be done in respect of DWA's drilling performance. Should such exercise confirm that DWA's activities are more expensive than those of private contractors, the drilling section of DWA should gradually reduce in size until what remains is one (or two) rigs for use in emergencies only.

4.2.6. Most water supplies have been equipped with air-cooled Lister engines and mono-pumps. The standardization has facilitated maintenance, as all pumpers can be trained on the same technique and spare parts can easily be purchased and stored. This technique is considered by DWA to be the most appropriate. Simple technology (handpumps etc) has not been used as the groundwater level is usually said to be too low.

4.3. Performance of Councils (Operation and Maintenance)

4.3.1. For purposes of comparison, the recurrent costs, revenues and benefits of the DWA's operation and maintenance of the 17 major village water supply systems can be roughly compared with those of the district councils. The major village schemes were in 1988 serving about 250,000 people, who were consuming, according to metered records inspected by Natural Resource Services, an average of 50 litres of water a day (according to DWA 80% of this consumption was by users of private water connections and only 20% was drawn from standpipes, therefore per capita use of free water by the poorer people was probably no higher than in the smaller villages).

4.3.2. The DWA's 1988/89 estimated recurrent costs amount to about P5.75m and revenues to P1.49m (made up of P990,000 water fees to private connections and P500,000 charges for making private connections). Thus the DWA's estimated revenue for 1988/89 amounts to 26% of estimated expenditure, as compared to the district councils, who expect to recover only 4.2% of their expenditure in 1988/89. Largely as a result of the more buoyant revenue expectations from private connections in the major villages (a source of revenue not available in the smaller villages where there are few private connections) the average net direct per capita recurrent cost (subsidy) of supplying water in the 17 major villages will amount in 1988/89 to P17.04 for each person served, as compared with the council's per capita cost, calculated on a similar basis, of P18.58 per person.

4.3.3. If, however, the revenue expectations of DWA and councils from private connections were to be fixed at an equal level of 4.5% of expenditure, thereby rendering the two sets of figures more precisely comparable, DWA's estimated costs per person served in 1988/89 would rise to P22, or 18% more than those of the councils.

4.3.4. The councils also have to bear the expense of operating in 273 different and often widely separated localities where few economies of scale are available. Even though they probably supply only half as much water per person as the 50 litres a day average in the major villages, the councils' performance and efficiency in purely financial terms appears to compare well with DWA's.

4.3.5. The District Councils are in charge of the maintenance of all the rural water supplies of the VWSP. There is very little, if any, cooperation between DWA's district workshops and the depots of the Councils. Nevertheless, the District Councils have in general maintained their water supplies well. Most water supplies have been reliable and breakdowns have in most cases been attended to within a day or two. The maintenance administration of the water supplies could, however, be improved in some districts.

4.4. Transport

4.4.1. According to the report of the 1984 SIDA Evaluation of the VWSP, DWA had 241 vehicles, including tractors. The actual VOR (Vehicles off the road and unavailable) was estimated to be 25%, compared to an optimum figure of $\pm 12\%$. In 1988, DWA has 479 vehicles, with a VOR rate estimated at 20%.

4.4.2. Of more significance from the specific viewpoint of the maintenance and operations tasks of the VWSP itself, district council water departments/units in 1988 had 126 vehicles worth about P5m in 1988 prices compared to about 40 in 1984. The councils' VOR rate was 21% in 1988. Some of the capital funding of this increase came from the LG 56 component of the VWSP but more than half the increase came from DR 01 Drought Relief (DDF and EEC) funds.

4.4.3. As for replacements, 1988/89 district council recurrent estimates provided P2.48 million for replacement of vehicles. Given an average four-year life, replacement of water dept. vehicles alone would require provision of P1.25m. Water vehicles make up 16% of total council vehicle fleets of about 800 vehicles. We recommend that if water dept. fleets are to remain at their present size, total recurrent replacement provision for Council vehicle fleets in future years should be increased from P2.48m to P7.5m.

4.4.4. As for operation and maintenance costs, no separate figures are available for council water department vehicles. All council vehicles are lumped together for estimating purposes. On this basis, total recurrent provision for purchase of fuel and lubricants is P2.8m, and for maintenance and repair of vehicles in 1988/89 it is P1.61m. The latter funds are used to buy tyres and spare parts. No figures were obtainable to show the numbers and cost of manpower (mechanics, welders, etc.) employed on maintaining council vehicle fleets. The fleets total around 798 vehicles with a replacement cost of about P32 million at 1988 prices and the P1.61m maintenance and repair provision represents a very low figure of 5.37% of capital values. The Chief Mechanical Engineer of the C.T.O. estimates that a provision of 7.5% of capital value for spare parts and tyres is needed for optimum utilisation. We recommend that the maintenance and repair provision for 1989/90 be based on the provision of 7.5% of capital value of the council vehicle fleets.

4.4.5. The low provision for purchase of spares and tyres is made worse by the peculiar way in which councils are permitted and even encouraged to use private garages to supplement their own repair capacity. The only budgeted funds they can use for this purpose in 1988/89 are the P1.61m repair and maintenance votes. Thus the council mechanics have continually to face a trade-off in which they can only hire the skilled manpower of the private sector (at P20-P25 an hour) by exhausting the funds

allotted to them for spares and replacements. The main constraint on councils' own repair capacity is the shortage of trained technicians, and the councils save a great deal of money through having a large proportion of these posts vacant. We therefore recommend that councils should be enabled to use their savings on personal emoluments, not their spare parts votes, to hire private sector assistance with vehicle repairs.

4.4.6. The VWSP evaluation team experienced considerable difficulty in obtaining quantitative data relating to the size, composition and operations of council vehicle fleets from the various units of MLGL. It may be deduced from the limited analysis above that more work needs to be done at a professional level to rationalise and effectively to plan the future operations of councils in this field.

4.4.7. In this connection a SIDA consultant recommended in 1986 that MLGL should obtain an expert advisor in the field of transport/ mechanical engineering (E.B. Egner, The District Councils and Decentralisation 1978-1986, Gaborone, February 1987, pp. 54 and 12). The role of the expert would be to "advise councils and MLGL on the operational, budgetary, manpower and training needs of councils in the field of transport". MLGL responded (p.12) that "The Ministry needs a transport manager who can advise councils on the needs mentioned and also on supplies". In September 1988 there was no such officer in place. The evaluation team recommends that a transport/mechanical engineering expert be recruited as soon as possible.

CHAPTER 5. INTER-AGENCY RESPONSIBILITIES AND COORDINATION

5.1 What is a "Village"?

5.1.1. According to the Sixth National Development Plan 1985-91 (p. 205), the government's objective is "to have all villages provided with a safe and reliable water supply". It is obviously of crucial importance to define exactly what is meant by the word "village". The Plan, however, after stating that "the district councils select and prioritise villages to be included in the [VWSP]," only adds that "to be considered, a village must be large enough to have other public facilities such as a school, health post or government offices".

5.1.2. This criterion mentions no specific number of people who are to be served; it is completely open-ended and lends itself to a variety of conflicting interpretations, e.g. should a decision about the "other public facilities" be made first or can a water supply be put in before any decision has been made about the other facilities? Is the house-cum-office of an unmarried agricultural extension worker or game scout enough to justify selection of the settlement in which he lives for a P250,000 water supply?

5.1.3. The specific criterion for justifying the establishment of health clinics is a population of between 4,000 and 8,000 people within a radius of 15 km, and for health posts "a population of 500-1000 people" (p. 309, NDPVI 1985-91). There were 150 clinics and 250 health posts in Botswana in mid-1988 compared with 273 rural village water supplies. The average primary school in Botswana has about 400 pupils, which implies a minimum population in the average school's catchment area of 1500.

5.1.4. According to DWA's "Complete List of Village Water Supplies Identified (373 Villages)", drawn up in 1988, 65 of the villages which have either already been supplied with water under the VWSP or are to be supplied in VWSP VI 1988/92 had a 1981 Census population of under 200 people. Even if such settlements have grown at the national average rate of over three percent since 1981 (and this is against the odds during a period of extended drought) their population will still in most cases be far below the minimum stated requirements for a health post or a school. In other words, it is unlikely that inclusion of these 65 "villages" in the VWSP could be justified even by reference to inadequate selection criteria which are set out in the National Development Plan.

5.2 Who Bears Responsibility?

5.2.1. There is a lack of precise, detailed and unambiguous criteria for determining which rural villages or settlements should receive water supplies under the VWSP. This exacerbates a situation where no-one at any point in the system really knows

which ministry, MRWA or MLGL, is responsible for the VWSP and neither ministries nor councils take responsibility for the waste of resources. Thus, the district councillors who decide where they want the new supplies to be located are aware that they will be built by DWA, a central government department, not by council staff and not with council money; in the absence of specific criteria the councillors are easily able to override the advice of their own staff, who cannot claim in these instances that they will be held financially responsible if public money is wasted.

5.2.2. Meanwhile, when the council priority lists are received by MLGL, they refer to expenditure of MRWA funds held under NDP Project WB42 so MLGL does not interfere with another ministry's administration of the funds entrusted to it by Parliament. Finally, when the council lists reach MRWA and DWA, they are treated as the final decisions of autonomous elected bodies which may not be questioned by anyone in DWA. In the absence of effective planning criteria, no-one at any point in the system has a clear duty to intervene or call for review and justification of even the most questionable decisions.

5.3. What is Meant by "Access"?

5.3.1. A related question is that of the criteria for deciding what is meant by "reasonable access" to a safe and reliable water supply. The Ministry of Health's objective is that all rural people should be within 15 km of a manned health facility, and by this criterion 85% of the rural population already has access to health facilities. The key criterion of the VWSP can be deduced from the design standards adopted by DWA for the VWSP reticulation systems: it is that every rural Motswana, no matter how small the village, should be within 400 metres of a water supply standpipe. By this criterion, (when applied countrywide) less than 50% of the rural population in 1988 had "access" to water. Given the size and population density of Botswana, the 400 metre criterion can be combined with the lack of any definition of the minimum size of village to be served; given the inadequate and open-ended criteria presently in use, another thousand "village" water supplies could be justified before anything like 85% of the rural population would have "access" to water as the term is presently being defined.

5.4. Need for New Planning Criteria

5.4.1. New, detailed and unambiguous criteria are clearly (and urgently) needed in order to provide a rational basis for planning decisions in future phases of the VWSP. The obscurity which presently surrounds the locus of responsibility for implementing the different elements of the VWSP should also be removed. We recommend that until new criteria for location of VWSP systems have been developed, no new VWSP systems should be constructed.

5.5. Defining Inter-Agency Responsibilities

5.5.1. Our understanding of the situation is that there is an overall water policy which is the responsibility of MRWA and a health policy which is the responsibility of MOH. The policies having been determined by the responsible ministries, the district councils bear the undivided implementation responsibility for supplying the rural public with safe water and for the management and operation of the primary health care system. The councils may seek advice and assistance from central government specialists when they need it. They are subject to the general direction and guidance of MLGL which, alone among central government ministries has the right to control councils and, in need, to give orders to them.

5.5.2 Thus, in order to clarify administrative and management responsibilities for implementation of future phases of the VWSP, we propose recognising the de facto and de jure undivided responsibility (and authority) of MLGL and the councils in a number of ways.

5.5.3 We recommend that the GOB should define what it means by the word "village". Once this has been done we recommend that new criteria for location and construction of water systems should be drawn up and promulgated by MLGL in consultation with the councils, DWA and, particularly, with the Department of Town and Regional Planning, which is responsible for implementation of the national settlement policy.

5.6. Funds should go with Responsibility

5.6.1. The practice of warranting one lot of funds, for new construction, to MRWA (NDP Project WB 42, Village Water Supplies), and the funds for rehabilitation and extension to MLGL (NDP Project LG 56, District Councils Water Supplies) is redundant and creates confusion over responsibility and planning, administration and management of VWSP operations at all levels. We recommend that all funds to pay for design, construction, rehabilitation and extension of council owned water supplies under the VWSP should be warranted by MFDP to MLGL.

5.6.2. In effect this recommendation means that NDP Project WB 42 should cease to exist and all capital funds for design, construction, rehabilitation and extension of rural village water supplies should be channelled to and accounted for through the single medium of Project LG 56. The hiring of DWA as a design/construction agency by councils or by MLGL acting on their behalf would of course continue, but it is hoped that the new administrative arrangements will end the impression that a kind of dual control exists at all levels. It is this ambiguity which has led to the present situation, described above, in which neither councils nor DWA know who is ultimately responsible for deciding where new VWSP facilities are to be

located. We note here also that the arrangement we have recommended is consistent with the arrangement DWA already has with the Department of Wildlife and National Parks (DWNP). DWNP, the client, has the capital funds, which is warrants to DWA, the agent, as needed.

5.7. Coordination of Water/Sanitation/Hygiene

5.7.1. Coordination of activities in the fields of sanitation and water hygiene at the national level is also extremely weak and ineffective. The nearest thing there is to a coordinating body at the national level is the Interministerial Water and Sanitation Committee (IWSC) chaired by the Director of Water Affairs. The IWSC did not meet at all from 1983 to early 1988. At that time the new Director revived the committee, and the IWSC met three times in 1988, with its discussions centred on technical issues concerning the major villages and urban areas. The Director of Water Affairs, the head of an operational technical department of MRWA, has no policy making responsibilities. Above all, although he has statutory powers to enforce pollution control decisions under the Water Act, he has no day-to-day authority over the operations of the councils, which, as we have seen above, devote some 40% of their staff resources and P24m of recurrent funds to the implementation of the government's primary health care strategy, including sanitation and water hygiene.

5.7.2. We recommend that the chairmanship of the IWSC should be held by a senior administrative officer of MLGL, the parent ministry of the councils. We also recommend that the secretariat duties of the committee, and the responsibility for ensuring that its decisions are carried out should be delegated to the Senior Public Health Engineer (SPHE), MLGL. We further recommend that all concerned should be advised that the councils, specifically the District Medical Officers in their capacity as heads of council health and sanitation departments are responsible at the district level for implementation of the government's policies in the fields of environmental sanitation and water hygiene. The appointment of an MLGL officer to hold the chairmanship of the IWSC should help in achieving acceptance on the part of all units of MOH, MORWA and MOA that whilst their inputs of technical and policy advice are vital, MLGL alone bears the undivided responsibility at national level for carrying out the government's policies for environmental sanitation and water hygiene, through the operations of the council health departments at district level.

5.7.3. DWA wishes to control coordination of the issues concerned with pollution control (for which he bears statutory responsibility) and siting of water facilities and latrines in the major villages but not in the rural villages. Coordination of operations under the VWSP in the rural villages (i.e. ensuring that the siting and design of pit latrines and of water supplies is controlled by a single authority) is a matter for

the councils, advised by the SPHE/MLGL. We recommend that MLGL, the district development committees and the councils should take urgent steps toward meeting the need for better pollution control and for coordination of water/sanitation/ hygiene operations at the village level.

CHAPTER 6. WATER HYGIENE AND THE PRIMARY HEALTH CARE SYSTEM

6.1 Environmental Sanitation

6.1.1. Implementation of the GOB's policies on environmental sanitation is the responsibility of the health departments of the town and district councils, advised by the DWA, by the Senior Public Health Engineer (SPHE), MLGL, and by the Family Health Division of MOH. Capital funding is provided through NDP Project No. LG 51, Environmental Sanitation. The funds are used to construct subsidised pit latrines in the rural areas, including major villages. The LG 51 target for 1988-93, if P8 million of funds becomes available - a donor is still being sought - is to build in the smaller villages 8,400 VIP-type improved household pit latrines of the standard design already in the use by some 15,000 households in the urban self-help housing areas.

6.1.2. A reorientation in LG 51 project design since 1987 has reduced the role of directly-employed council staff and made more use of local building contractors. This simplifies project administration, increases output and reduces unit costs. The costs however, remain at a very high level: contractors were in mid-1988 quoting up to P1,200 per complete latrine unit (with lined pit), although UNICEF estimated the actual cost of a unit (with an unlined pit) at about P600. According to the SPHE, costs are expected to come down sharply when contractors have more experience of latrine-building and when they have received training under council/SPHE auspices. We recommend that the training of small local contractors in latrine building, should begin without delay.

6.2. Self-Help and Sanitation

6.2.1 The household self-help contributions toward the cost of the latrine consist of (a) P30 cash commitment fee; (b) household excavates the pit (labour cost P30); (c) household builds the superstructure (labour and materials cost about P250). The SPHE estimates that about 40% of the cost of a latrine is borne by the participating household; 40% by the central government or by donors in the form of capital grants; and 20% by the council's recurrent budgets.

6.3. Council Health and Sanitation Staffing

6.3.1. As for the staff directly available to conduct operations and public awareness campaigns in the public health/sanitation/water hygiene fields, the councils in 1988 employ 16 district and sub-district medical officers; three (UN Volunteer) public health engineers (four more UNV phe's are being recruited); 12 matrons; 28 health inspectors; 500 nurses, including community health and health education specialists; 600 paramedical village-based family welfare educators; and 800 health and sanitation technicians and labourers. About 40 per

cent of all council employees are in health-related posts. The councils' recurrent health budgets for 1988/89 amount to about P24 million, compared with P47m for the MOH in the same period.

6.4. MLGL - DWA - MOH Advisory Staff

6.4.1. In addition to the council staff listed above, MLGL has an advisory staff which includes the SPHE, the district water engineer, a public health engineer/advisor, a sanitation sector officer and two health educators, one specialising in sanitation, the other (an MOH officer) in water hygiene. The MLGL staff liaise with the health educators and inspectors of the MOH and the two civil engineers with sanitation qualifications in DWA, both of whom are primarily concerned with anti-pollution measures and improving coordination between water and sanitation operations in the major villages.

6.5 The Links Between Health, Sanitation and Water

6.5.1 The importance of the relationship between water, sanitation and health cannot be overemphasized. Though generally recognized, it is a difficult and complex relationship, because there are so many puzzling causal factors involved. One puzzling example may be quoted to illustrate this point. In a national survey of diarrhoea among children under five in 1986, the reported incidence was 250 per 1,000 in Gaborone (with its good water), while in Kweneng District with access to much poorer water, the reported incidence was only 85 per 1,000. However, it has been shown in East Africa, for example, that the frequency of the most common water-related diseases can be reduced by half if a clean water supply is available continuously, and if the quality is retained up to the point of its end use. (SIDA Water Strategy p 13). As far as the team is aware, no such research is being done in Botswana. The evaluation team has had to rely upon and is satisfied with the "common-sense" understanding that a good quality water supply is a prerequisite to improved health.

6.6 The Water Hygiene Education Programme

6.6.1. In 1984 MOH launched a Water Hygiene Campaign to increase the awareness of the importance of good water quality. In 1985 this endeavour turned into the Water Hygiene Education Programme, concentrating its efforts on primary schools and adult groups. A number of workshops have been held for VDCs, VHCs and teachers. Handwashing projects have started in over fifty primary schools. The head of the MOH's Expanded Programme for Immunisation and Control of Diarrhoeal Diseases is trying to improve the coordination with councils and with other departments involved in water-sanitation activities at national level.

6.7 Water Quality from Tap to Mouth

6.7.1 In the Socio-Economic Impact Study by R. White and his team, data was collected about the amount of coliform bacteria etc in household water. A general finding - also found in the water quality tests programme in 1984 - is that the tap water has satisfactorily low levels of contamination, while that from wells and surface water is unsafe. By the time the tap water is used for drinking, it usually contains more coliforms and in some cases alarmingly high levels. This problem cannot, however, be solved by water quality tests, but by changes in the handling of water in the individual household. We therefore recommend that no regular water testing is done, but testing equipment should only be used for controlling outbreaks of diarrhoea etc. We further recommend that council health departments should take steps to ensure that the Water Hygiene Education Programme is implemented in all villages. The educational process is a slow one and it takes time. Villagers soon know what they are supposed to do to retain water quality, but they fall behind when it comes to practice. This fact necessitates there being someone, respected by the villagers, to "push" sanitation matters at household level and at the water source.

6.7.2 The pumper is responsible for the cleanliness of the surroundings of the tap. With the envisaged development of water sources in smaller communities, including improvement of existing (traditional) water sources, (see 6.7.3. below) not all communities will have pumpers. Neither is it easy to engage the FWEs, many of whom are strongly oriented towards work at the health post. We recommend that the council's health education staff try to ensure that each small community elects a few people living close to the water source to look after environmental sanitation. These water supply caretakers or environmental volunteers could be trained in basic water hygiene and sanitation matters.

6.7.3 People living at some distance from a tap may use surface water whenever that is more readily available. This points to the need to protect all water sources. Neglect to do so may well lead to an upsurge of diarrhoea, chemical and biological pollution etc, especially at the beginning of the rainy season. Even though it may be undesirable for people to use such water sources at all, the reality that they do use them must be faced. There is an ample literature dealing with ways to protect man-made as well as natural water sources. We recommend that the protection and/or improvement of existing surface and temporary or seasonal water sources, which are used by people, should be included in the coordinated small community water and sanitation programmes. This extension work can generally be done by the villagers themselves. The implementation of the above mentioned improvements is rarely a task for the DWA's staff, but rather for teachers and health/community development staff.

CHAPTER 7. PRIVATISATION AND VWSP

7.1. Private Sector Capacity

7.1.1. The terms of reference for this study call upon us "to assess the private sector capacity within the water sector and to recommend on its use for the development of the water sector". We have done this under the various functional headings set out below.

7.2. Borehole Siting, Drilling and Testing

7.2.1. Private firms are in 1988 performing about 75% of the siting, drilling and pump-testing work of DWA, including work under the VWSP.

7.2.2. Six firms handle siting for DWA; seven, all with rotary rigs, perform drilling; and four carry out pump testing. Over the five months to 5 September, 1988, 59 boreholes were drilled, average depth 233 metres. At least another 200 boreholes are to be drilled by private firms for DWA in 1988-90.

7.2.3. DWA is in process of reducing its own siting and drilling capacity, and will in future directly handle no more than 25% of the government's demands, mainly for specialised boreholes, remote area supplies, emergencies, and to maintain its in-service training capacity. According to the Principal Hydrogeologist in DWA, privatisation of at least 75% of this work is expected to reduce DWA's recurrent expenditure on these operations by about 25%.

7.2.4. The inception in 1988 of the Consolidated Emergency Water Supply Programme (CEWSP), with targets of drilling some 406 boreholes in 1988-92 for villages, roads and wildlife, will place an exceptionally heavy strain on both DWA and private contractor resources. Use of contractors during this period will be very heavy, but 'normal' use of private sector capacity is expected to resume in 1992. The DWA is conscious of the need to consult with and, where applicable, jointly to plan long-term programmes in which the private sector is expected to take a leading part.

7.3. Design and Construction of VWS

7.3.1. The Design and Construction division of DWA intend to increase the involvement of private contractors and consultants. Approximately 90 % of its major village design work is now carried out by consultants, who are expected in 1988-90 to provide DWA with 172.5 man-months of technical and engineering design services.

7.3.2. DWA staff supervised all VWSP V construction work in 1984/88, but consultants supervised about 90% of construction in the major villages. It is planned that consultants will supply DWA with 66 man-months of technical and engineering supervision services in 1988/90, as compared to 20 man-months provided by DWA staff.

7.3.3. In the 29 months from 1st April 1986 to 5th September 1988, DWA's own crews erected 26 tanks for the VWSP with a total capacity of 842 M³; private sector firms erected 32 tanks with a total capacity of 3,683 M³. In the same period, DWA's crews equipped 122 boreholes and contractors equipped 13 for the VWSP. Since 1984, at least 360 boreholes have been equipped each year by the private sector for its own use, according to the Secretary of the Water Apportionment Board.

7.3.4. DWA's own labour crews undertake almost all reticulation work on VWSP schemes (valued at P15m in 1988/90), but private contractors carry out 90% of the same work (valued at P54m in 1988/90) in the major villages. If DWA should decide to reduce its own directly employed workforce, or if councils were to give out the contracts themselves, VWSP reticulation work could be handled in most districts by some of the small rural building firms which are presently working at below optimum capacity; this is evidenced by the fact that it is common for 12 or more tenders to be received by councils which advertise quite small remote area building construction contracts. We recommend that more use be made of small local contractors in VWSP schemes. It should be noted, however, that the employment effect of 'privatising' this work would be very small, since DWA already uses labour-intensive methods and hires casual labourers to perform the work in their own home villages.

7.4. Maintenance of VWS

7.4.1. Four Gaborone firms and two in Francistown offer diesel engine reconditioning services. The Gaborone ones can perform 17 major overhauls (including reboring and crankshaft regrinding) a week, and the Francistown ones can handle seven a week. All six operate in their own workshops, not in the field. They are constrained by the lack of a main agent for Lister engines in Botswana, with consequent difficulty and delays in obtaining spare parts from South Africa.

7.4.2. Mono Pumps (Africa) Ltd, whose pumps are in use on most boreholes in Botswana, service and repair their own products in Gaborone. Scan African Trading Ltd repair and service photo-voltaic and conventional electric-powered pumps in Gaborone; they are developing a mobile service unit to service and repair such pumps on site.

7.5. Conclusion

7.5.1. Given the amount of private sector involvement in the public water sector, as described above, we are fully satisfied that DWA under its present administration can be relied upon to use private sector capacity wherever this use is both appropriate and economical. The costing exercise described under paragraph 4.2.5. should be extended to include all contractual works (civil works, drilling, design etc). Should such exercise prove that hiring private contractors is more cost effective than using "in-house" services of DWA, we recommend continued use of private contractors.

CHAPTER 8. MANPOWER - VILLAGERS AND STAFF

In this section we present our views on the human resources available in the water sector, like skilled villagers, extension workers, industrial workers and pensionable staff at district and central level.

8.1 Village Level

8.1.1 The pumper/borehole operator is responsible for the operation and part of the maintenance of the pump and reticulation system. (S)he is employed by the district council and reports to the water development or maintenance unit of the works department. The terms of work are similar to those of daily labourers.

8.1.2 The family welfare educator (FWE) is responsible for first aid and primary health education in the village. She is employed by the district council and often works at the nearest clinic or health post. The minimum qualification required is Std VII or equivalent, and terms of work are those of pensionable staff.

District	Pumpers	NUMBER OF Part time and <u>Relief Pumpers</u>	FWE	Snr.FWE
Central	148	156	168	26
Ghanzi	19	21	15	
Kgalagadi	28	27	21	6
Kgatlang	24	24	34	1
Kweneng	60	4	69	8
North East	39	1	25	6
North West	52	54	49	8
South East	15	-	16	5
Southern	<u>60</u>	<u>60</u>	<u>75</u>	<u>6</u>
Total	<u>445</u>	<u>352</u>	<u>472</u>	<u>75</u>

Source: Gov. Establishment Register for Industrial Class 1988/89
MLGL Establishment Register for Local Authorities 1987/88

8.1.3 The formal organisation within the village is as follows. The kgotla elects a Village Development Committee (VDC) as its executive committee to handle the planning and day-to-day activities. Often there is also a Village Health Committee as a VDC sub-committee. The activities and interventions in the village are sometimes coordinated by a village extension team having as members the FWE, Community Development Assistant, headmaster and the Agricultural Demonstrator.

8.1.4 In the smaller villages, labour is available, although there are very few villagers with skills of any kind, e.g. housebuilders, brickmakers, bicycle repair mechanics etc. Councils should encourage the self-help efforts of the

Councils should encourage the self-help efforts of the villagers and only hire contractors to do some of the water and sanitation work, in cases where the villagers fail to do it for themselves.

8.2 Intermediate Level (extension)

8.2.1 In every second or third village there is a clinic with a few nurses and transport. In most of the remaining villages there are health posts with a FWE and possibly an enrolled nurse. There is usually a community development officer assisting the village in development activities. The Sanitation Coordinator is responsible for environmental sanitation activities like latrine projects.

8.3 District Level

8.3.1 Planning and budgeting of many public sector village activities is done by the district council. The councillors are drawn from the villages and each one represents several villages. The district administration assists the council in its work.

8.3.2 Few industrial class posts are vacant and therefore only the actual number of positions is given in Table 1. The table also indicates the need to transfer staff from one district to another. As the situation is not as favourable for pensionable staff, (Table 2), we also present the number of vacancies. The industrial class is so numerous at some councils and in DWA that its size may defeat any meaningful supervision and management. The suspected overmanning will be even more substantial if the district-based DWA staff joins the councils. For example in one district there are altogether nine diesel mechanics to take care of some 60 engines owned by the council. We recommend maximum austerity in creating new industrial class posts in water departments and in recruiting replacements for upcoming vacancies, even though the new water schemes imply more work.

8.3.3 It may be appropriate at this stage to mention that there are some private drillers in most districts. For example there are three contractors in Maun with percussion rigs who are able to drill 100-150 meter deep boreholes. At present they are drilling cattle boreholes for private farmers and they have spare capacity.

8.4 National Level

8.4.1 In the ministries there are Batswana professionals and expatriate advisers. There are a number of training institutions.

CHAPTER 9. TRAINING

9.1 Training Policy

9.1.1 Training and education has been emphasized since Independence. Primary education reaches some 240,000 children and adult education is catching up. According to the National Migration Study 1982, 68% of those with post-primary education were employed by government/councils, albeit the public sector share of total formal employment was only 30 percent.

9.1.2 During the latest decade a number of reports have looked into the training and education of civil servants (Watson 1978, Picard 1981, Egner 1978, 1982, 1987). A common theme in these reports is that training for civil servants should be geared towards specific tasks rather than providing general education.

9.2 Training of Villagers

9.2.1 The way chosen to implement the rural village water supplies programme so far includes a minimal training component and no village institution-building component. Some male villagers are paid by DWA as casual labourers to dig trenches. The result is that most villagers only experience that the water is there, but not how it came about.

9.2.2 The pumper has had at most a one-week training and only occasional supervision (=on-the-job training) by the senior borehole operator. Starting in December this year some councils will be assisted by ULGS to train their pumpers at one-week courses. The course, designed by SIPU, is very job-oriented and concentrates on service of the diesel engine and pump, caretaking of the environment, log-book keeping and ordering of fuel and repairs. The training will take place in the district and be arranged by trained part-time trainers among the water unit staff.

9.2.3 The evaluation team has not come across villages where there has been an extended effort to inform the villagers about the new water supply, its potential benefits and likely shortcomings. The question of environmental cleanliness around standpipes seems to be focussed on the villagers being required to fence it in. The above indicates that the present procedures fall short of the aspirations of SIDA:s Water Strategy. The Water Hygiene Programme is not part and parcel of DWA:s construction of boreholes and reticulation systems. This question of community participation and environmental sanitation will be even more tricky, now that private contractors are employed. We recommend, (a) that all pumpers should be trained as soon as possible in accordance with the syllabus already proposed by ULGS; but (b) that the cooperative community relations aspect of the pumper's work should be more stressed in the pumper's course along with communication skills. We

further recommend (c) that groups of handpump caretakers/environmental volunteers should be trained in preventive health/environmental sanitation measures and communication skills.

9.3 Training of staff

9.3.1 It is our impression that the expansion of Botswana's education system has now begun to bear fruit. It is becoming easier to recruit well-educated and even qualified staff. Because of this, lower ranks of employees can no longer expect their employers automatically to support year-long training courses and subsequent promotion. Today there is competition to enter training institutions, and even successful trainees cannot always be sure of having a job after completion. If this is a true picture of the new circumstances for training, then this information must be forwarded to employers and employees alike. Unrealistic expectations about training prospects are causing a good deal of frustration.

9.3.2 It is also our impression that most employees look upon institutionalized training and subsequent virtually automatic promotion as the major incentive to work. This will remain the case as long as there is an alleged shortage of trained manpower. (Possibly longer, as a paid training of two years may render the trainee a salary increase of well over one hundred percent.) Once it is clear that there is enough trained staff, the employees will begin to appreciate the value of shorter, job-oriented, training. In the end, having a job may be an incentive in itself.

9.3.3 It is thus extremely important today to stress one incentive which is much overlooked; that of being informed about the workplace, what is planned etc. The councils provide for all new staff a one week induction course. This is a good foundation that has to be followed up by recurrent information in each unit. The employer cannot expect full dedication on the part of the employee, if (s)he doesn't understand the relationship between her/his daily work and the purpose and direction of the department or unit. The time has come (with enough trained personnel) when the civil servants will demand that they be kept well informed. We recommend that the need to keep all staff fully informed about the context in which they work be stressed in managerial training at all levels.

9.3.4 The content of work is changing, and sometimes drastically. When, as an example, DWA has started hiring contractors to drill four-fifths of its boreholes, some of its employees should be given completely new roles. In such instances, there is a need to prepare staff and others for the changes. Referring back to the recommendation in the preceding paragraph, the need is to keep the employees informed.

9.3.5 In order for the industrial class to be better prepared for coming changes, we recommend that industrial class workers should be encouraged to develop skills in more than one field. The pipe-fitter should develop a self-interest in plumbing. The drill rig foreman should be acquainted with the skills of a mechanic etc. Such multi-skilled workers can take care of a wider range of tasks and responsibilities, and this will be an incentive in itself.

9.3.6 The councils and ULGS HQ have embarked on an ambitious scheme whereby the council assesses the training needs of all employees and compile this information into an annual training plan. Comments on the present training activities within ULGS and DWA are shown below.

9.4 Professional/Technical Training

9.4.1 A large number of students are enrolled in formal water sector technical training in Botswana and outside. Three are pursuing Masters' degrees, 6 Bachelors, 12 higher diplomas, 12 diplomas and 29 certificates for technicians. These numbers in training in 1988/89 in the water sector give an indication about the rate at which the present back-log of vacancies and posts held by expatriates will disappear, (see Annex 1). We estimate that, provided departures of qualified people for the private sector are kept within reasonable bounds, all DWA and council engineering and technical posts will be localised by 1992/93 in accordance with the annual reports of the Presidential Commission on Localisation and Training. The one qualification to this statement is that increasing use of private sector consultants and contractors may call for a handful of people who are both well qualified and have lengthy experience.

9.5 In-service training - pensionable staff

9.5.1 The evaluation team strongly supports the steps taken by ULGS to develop a training programme aimed at task-oriented training performed as close to the duty station as possible. The central SIPU-courses for key personnel in the districts are at most two weeks long. They deal with areas like general management, personnel management, finance and law. Two test courses in building inspection and water supply maintenance have been developed. Also training of trainers for the in-house training programmes is being tried out this year.

9.5.2 The in-house training programme has been in operation since 1983. The trainers are local resource persons and they use standardized materials produced by ULGS. Of interest to the water sector are one- month courses in technical drawing and cost estimating and a two week course in contracting and tender procedures.

9.5.3 The ULGS also offers in-service mobile training in the districts and sub-districts. This is mainly on-the-job training. Among these can be mentioned a ten day course in Supervisory Management for TAs and STAs and a five day course in Village Community Development. As for training for council water staff, the TA and TO staff will have access to up to nine different courses in a little more than a year's time. (See Table 3).

9.5.4. The magnitude of training of ULGS officers (not only in the water sector) during 1988/89 is summarized as follows:

- 6,2 percent attend institutional training at home or abroad
- 26,1 percent attend In-house training High percentage attend SIPU courses
- More than 5 percent of the total working time is devoted to institutional and in-house training.

The average cost per training week is P73 for institutional training in Botswana and P508 abroad. The evaluation team supports this high rate of training for a year or so. The training must then be drastically reduced as the number of employees is small. Furthermore, it is often necessary to conduct a trial or diagnostic course to find out what actual skill and knowledge the students have.

9.6 In-Service Training: Industrial Class

9.6.1 Apart from the training for promotion discussed above, training for industrial staff is dominated by on-the-job training to pass the trade tests. DWA anticipates the following number of industrial staff will sit for trade tests during 1988:-

Pipe fitters,	31 candidates	(few of the 40 posts are vacant)
Bricklayers,	36 candidates	(there are only 13 posts vacant)
Carpenters,	11 candidates	(there are only 3 posts vacant)
Tank Erectors,	25 candidates	(no posts available)
Borehole Mechanics,	31 candidates	(few of the present 38 posts are vacant)

As can be seen from above, there is very little coordination between posts available as skilled workers and the number of candidates. DWA also arranges the following short courses:-

Fire Fighting,	1 day for 50 trainees
Preventive Maintenance on drilling rigs,	5 days for 30 trainees
Welding Safety,	3 days for 5 trainees
Basic Geology,	5 days for 30 trainees

9.7 Recommendations

9.7.1 Given the obvious overlapping in DWA and council water sector staffing, we recommend that all training activities, especially for district staff, should be coordinated immediately between DWA and ULGS, since it seems highly probable that many if not all DWA field staff will eventually be seconded/transferred to work for councils. We also recommend that private sector staff should be invited to the training programmes in order to improve their performance as contractors.

CHAPTER 10. RECOMMENDATIONS FOR FUTURE SIDA SUPPORT

10.1. Smaller Communities

10.1.1. At present, about 80 % of Botswana's population depend on groundwater. So do most herds of cattle and livestock, particularly during the dry season. Groundwater is of the utmost importance for Botswana's development and it is in many parts of the country the only water resource that can be developed economically. It is estimated that there are some 10-12,000 private and public boreholes in the country. At present all larger communities have a water supply and DWA is heading towards even smaller communities.

10.1.2. In order for the villagers to have a choice of technology when it comes to water, it must be easily available. A preliminary summary of data, collected by the 1981 census, on groundwater sources and number of people in small communities, has been compiled by the Water Resources Engineer of DWA. The diagrams below show that some 140,000 people live in settlements with less than 400 people. Most of them use dams, rivers and riverbeds. In these areas there are good prospects of protecting and/or extracting water in several ways. If there are some 1,500 settlements, the cost if the present technology were used would be exorbitant. The approach requires area concentration in order to be manageable.

DIAGRAM 1: Number of settlements in relation to their size

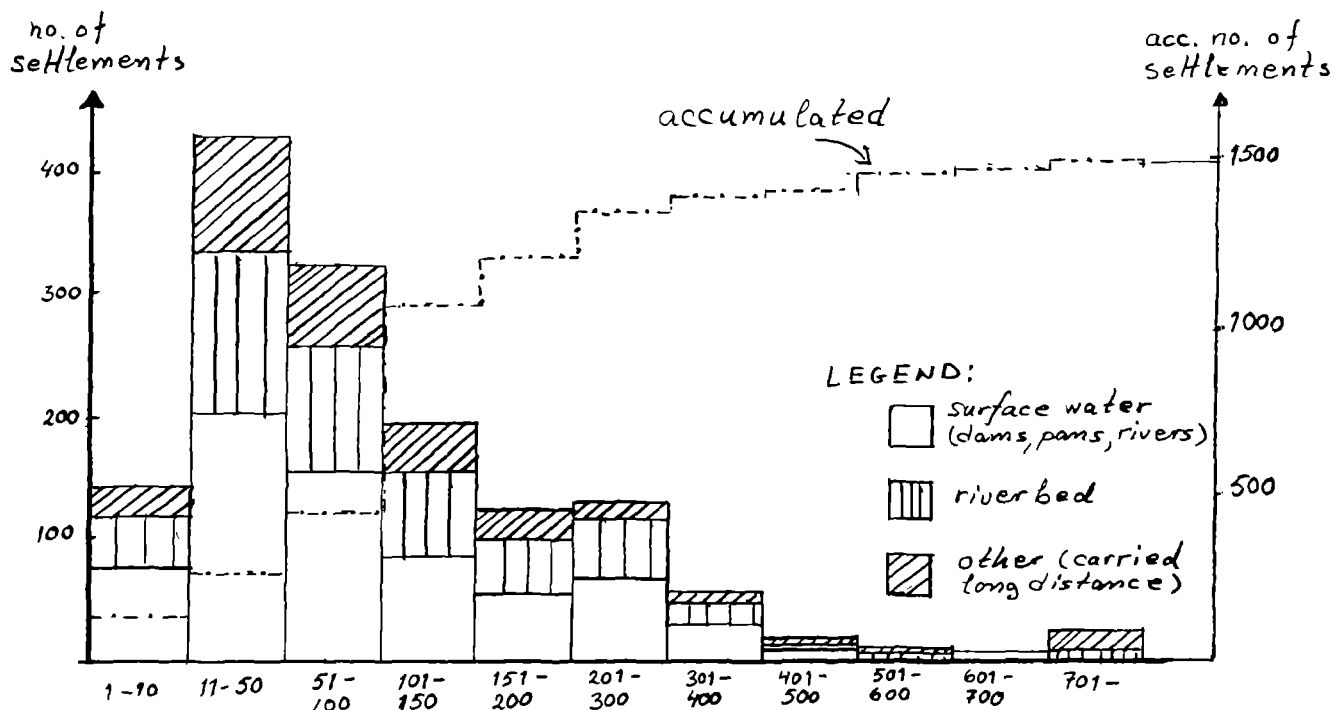
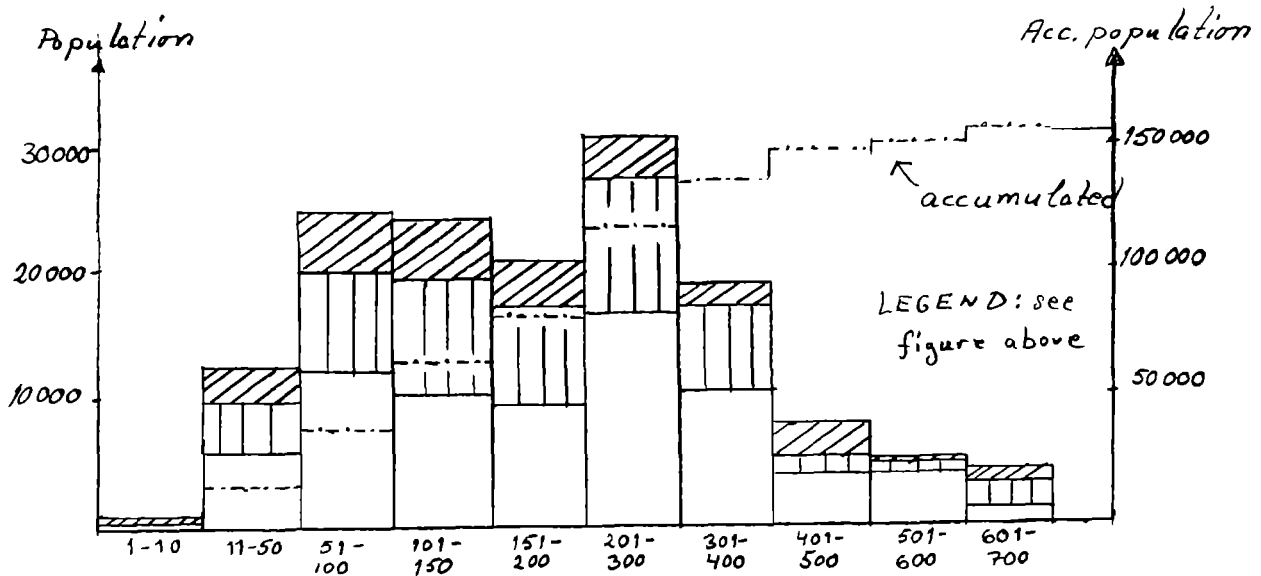


DIAGRAM 2: Population in relation to size of settlements



10.1.3. The groundwater level in Botswana is generally very low and some boreholes are more than 400 meters deep. The average depth of the boreholes drilled under the VWSP is about 150 meters. In some areas, however, the water rest level is relatively high and there are clear indications that there may be good potential for shallow wells. A sample of 5,197 boreholes from a data bank (Geological Survey, Lobatse) showed that 1,470 (28,3%) have a water rest level of 30 meters or less above the ground. All these boreholes are located on a 60 kilometer band along the south-east border from Lobatse to Serule. There is also some potential for shallow wells in other parts of Botswana. Most areas in North-West District and many river banks in North East District are known to have high groundwater levels.

10.1.4. In the introductory chapter on community participation we mentioned the prospect of participation in smaller communities. Also we noted the decay of traditional leadership in many areas. These circumstances and others make room for innovative approaches, different from the large-scale turnkey projects applied so far. It is a challenge to identify feasible interventions in the water and sanitation sector of societies with substantially changed social fabrics. It will require social ingenuity rather than blue-prints. Such an approach or method to promoting improved water and sanitation certainly requires staff who are sensitive to people's wishes and attitudes. This social-oriented approach may not be inexpensive compared to the hitherto used technology. But, the investment

this time is in the villagers' skills and self-reliance and in institution building. There is therefore a possibility of people entering into other activities like protecting existing water sources, to invent ways to maintain installations etc. The villagers may also decide on having latrines and not necessarily the VIP-type.

10.1.5. This method of approaching villagers requires some conditions to be fulfilled in order to get going:

- sufficient time
- experienced professional support
- political back-up

We have recommended that a programme be worked out to this end. Our intention is that a method be worked out approaching and raising villagers' interest in order to persuade them to take the responsibility for their own water and sanitation activities. We think that the earlier noted handwashing project is an example of such an approach. We may also mention an example from Kenya, where "listeners", trained by CARITAS, help the villagers to formulate central problems faced by the society and to develop a strategy to solve some of these. Another approach is presently applied in Tanzania, where villagers voluntarily join a study group (similar to adult education classes) in which they discuss water related problems in the village and perform practical exercises to remedy the problems (dig a well, protect a pond, etc). The study group leader uses radio cassettes with stories and cases to ignite the tossing around of ideas. In these examples the guiding principles are that the initiative remains with the villagers, and the agent is only igniting. A method should be worked out, tried and modified so that it is relevant to Botswana.

10.2. Augmentation of Existing Water Supplies

10.2.1. Population growth and migration have in many villages caused the once-appropriate water supplies to be outgrown. Many supplies can no longer provide water for all the people who live within the supply area. Furthermore, in some villages the present subsidised tariff system leads to water wastage at a few individual connections and consequent shortage of water in other parts of the reticulated system. The tap at the end of a supply system may only trickle water, if any is coming at all. It appears that people complain about inadequate supplies as often as they complain about breakdowns.

10.2.2. A good number of existing reticulated water supplies are in need of augmentation, as the demand for water far exceeds the supply capacity. DWA has performed major augmentation work on seven supplies during 1984-88 and plans to carry out similar work on 60 supplies during 1988-92. We consider that many of the new water supply systems planned for 1988-92 are in villages which are too small to justify their cost in economic terms. We

have accordingly recommended a complete suspension of new construction until more relevant criteria have been developed (see paragraph 5.4.1. above). Until this has been done, we consider that it is likely to prove more economical to augment existing water supplies in medium-sized villages than to build new ones in very small settlements. More people will be served at a comparatively low cost should existing water supplies be extended.

10.2.3. Even though this type of supply does not strictly qualify for SIDA support according to the Water Strategy, the evaluation team feels that such work, when properly justified by reference to detailed criteria, should continue for the present to be supported by SIDA. The criteria are needed for augmentation works for the same reason as they are needed in connection with new systems - to avoid wasteful and uncontrolled proliferation of expensive water systems into areas where less costly and more appropriate technologies are needed. The evaluation team recommends that SIDA should in 1988-92 support such augmentation works as have been identified by DWA, provided appropriate criteria for their selection are drawn up before the end of 1988. SIDA's involvement in this work should, however, gradually be phased out and we recommend that no support be given for augmentation works after 1992.

10.3 Technology Choice

10.3.1. It is appreciated that the approach outlined above is not suitable in all places of Botswana as the groundwater is too low. In such areas, the present use of expensive capital-intensive high technology may be the only solution. However, where the water rest level is 30 meters or higher, we consider that handpumps should always be considered the most suitable choice of technology.

10.3.2. Other technologies than handpumps have been tested in a number of African countries. Many agencies and donors have carried out research and investigations on pumps driven by solar and wind power. After some 20 years of testing and development, one is still on the "pilot project" level and no significant positive results have come out. Handpumps are therefore considered to be the superior choice of technology, and SIDA should not be involved in any other technology.

10.3.3. The evaluation team considers that water supplies are more reliable, sustainable and affordable when a simple technology is used, even if that technology is a labour-intensive one. One easily forgets that most Botswana had to rely on hand dug wells and ponds in the rural areas, before independence. Boreholes with diesel driven engines, monopumps and reticulation systems are fairly new inventions. It is felt that alternative, cheap and labour-intensive technology should, to a much larger extent than before, be tried and developed. Such water supplies are also more suitable for integrated

development with sanitation and health education than the conventional supplies with Lister engine and mono pumps. Furthermore, development of a number of small independent water sources (i.e. open wells or handpumps) can make a village less vulnerable to the consequences of complete breakdowns and non-availability of water. Handpumps should also be considered as back-ups for diesel systems where this is feasible.

10.3.4. According to the SIDA "Water Strategy", support to new water installations shall only be given where satisfactory maintenance can be guaranteed. The same criteria also apply to rehabilitation and extension works. The choice of technology shall take into account hydrogeological, economic and social factors. Simple and inexpensive solutions (for example open wells and handpumps) are preferred. Furthermore, the "Water Strategy" stresses that SIDA shall avoid giving assistance to installations with distribution systems for private, individual connections.

10.3.5. With regard to the need for a simpler technology, we recommend that:

(a) SIDA funds be used for construction of water supplies of simple technology (handpumps and open wells) in areas where that technology is feasible. Such areas should be defined and the criteria presented to SIDA before funds are released.

(b) SIDA should be informed of the ways in which the development of the water supplies is to be integrated with sanitation and health education at the village level

(c) handpumps should be considered and financed by SIDA funds under LG 56, as backups in areas where existing diesel systems are to be extended.

10.4 Training of Staff in ULGS and DWA

10.4.1 We have encountered progress in training of personnel, especially within ULGS. The present support seems appropriate. The very high amount of man-weeks of training provided may be beneficial to develop and test training ideas, and after a few years ULGS will remain with a smaller standardised training programme. The conscious steps taken to train trainers will eventually reduce the demand for short-term experts, but the SIDA advisory staff should be available during the VWS VI.

10.4.2 The on-the-job training at DWA seems to need support for another year or two. In 1988/92 we hope that in-house training will be institutionalised. Most of the training programmes can be run together with ULGS, and this coordination

should commence soon. A standing committee under the chairmanship of the Establishment Secretary, ULGS could be given this task of coordination.

10.4.3 As for training of the higher professionals, U.L.G.S and DWA can rely on Botswana training institutions. An obvious exception to this is the training of civil engineers. The diploma courses at the Polytechnic could probably serve this demand as well as that from ULGS and the private sector. The present idea in ULGS of establishing in-country training in this field may be feasible. The team recommends that a study be conducted of the volume of envisaged civil engineering training needs and whether these can be met by the Diploma programmes. Irrespective of the result of this study, we recommend that SIDA support is given to the Polytechnic to recruit teachers. The present facilities at the Polytechnic are under-utilized compared to similar institutions in Europe, and can easily accommodate new study programmes.

10.5 Swedish Technical Assistance Personnel

10.5.1 At present SIDA is providing Swedish Experts, Technical Assistance Personnel (TAP) at various ministries and institutions in Botswana. The TAPs related to the water sector are attached to MLGL (four) and DWA (nine). There is no SIDA funded TAP assigned to MOH or to the District Councils. All TAPs are in the line organisation of the ministries and act purely as gap-fillers.

10.5.2 Four TAPs at MLGL are directly (or indirectly) involved in the water sector. A Senior Manpower Planner and an In-house Training Coordinator are assisting MLGL with various training activities funded by SIDA. Two Senior Water Engineers supervise the activities in district councils.

10.5.3 Nine TAPs are assigned to DWA. There are two TAPs at the Design and Construction Division, four TAPs at the Groundwater Division and one each at the Mechanical and Electrical Division, the Operation and Maintenance Division and the Training Section respectively.

10.5.4 According to the Water Strategy, the TAPs shall "reinforce the authority's capacity to carry out all components in the projects agreed with Sweden". The aim is also to "increase the central capacity of the authority in those functions which are vital to the effective implementation of the planned programmes".

10.5.5 The team has certain views on the recruitment of expert expatriates. The key advisory positions require experienced professionals, who are also in short supply in Europe. One feature of the expert's task in Africa is to prepare a counterpart to take over. This is not a common assignment for professionals in their home countries. In order to be able to

recruit experts it may be of help if some contracts are set up in such a way that the expert is in Botswana for one or two months at a time and then returns to work in Sweden for six months or so, followed by another short stay in Botswana, and so on. People of a very high calibre who are not prepared to leave their careers and networks at home, may become available to work in Botswana on these conditions. From the Botswana side, the expert/adviser could not be working in the line and perhaps doing the counterpart's work for him; the counterpart will carry the real responsibility of the post without being overshadowed by the continuous presence of the adviser.

10.5.6 The evaluation team recommend that:

- SIDA officers responsible for recruitment of TAPs for Botswana should obtain copies of the annual reports of The Presidential Commission on Localisation and Training, in which target dates for localisation of all TAP posts are specified. The reports are available from the Government Printer, Gaborone.
- SIDA should continue to support MLGL with TAPs at the same level as today, with the possible addition of a transport manager/mechanical engineer should MLGL request a SIDA recruitment.
- The need for a possible Coordinator for the Water, Health, and Sanitation Programme be considered as SIDA's support changes direction towards small scale integrated water and sanitation facilities and training activities.
- SIDA consider supporting TAP at training institutions such as IDM and Polytechnic.

CHAPTER 11. RELATED STUDIES

11.1. Botswana Rural Water Supply Cost and Tariff Study

11.1.1. The team read the above study prepared by Interconsult and discussions were held with the author. The Study analyses the present situation as regards capital and recurrent costs of the VWSP. People with individual connections at a reticulated supply are charged 30 thebe per cubic metre. In those cases the consumption is not metered, the consumer pays a flat monthly rate of P2.25. Most institutions, like schools and hospitals, get free water. The present revenue collection is poor and only 4% of all water consumed is actually paid for.

11.1.2. The cost recovery objective of the Government of Botswana is to cover the costs of operation and maintenance. This policy has never been implemented and the Study considers the objectives unrealistic in the rural villages.

11.1.3. One of the findings was that the major recipients of the Government subsidy are the high use, better off consumers. Furthermore, it was shown that flat rate tariffs encourage wastage of water at individual connections.

11.1.4. The Study recommends the following tariffs for private connections in major and rural villages:

P0,30/m	for the first 5m /month
P1,50/m	for usage between 5 and 20m /month
P2,50/m	for usage in excess of 20m /month

There are no water charges at public standpipes.

11.1.5. The cost recovery is not expected to cover even 10% of the recurrent costs. In spite of that, the Study argues that the tariffs are justified as it would reduce consumption and reduce the need for augmentations. Although we consider the increases in charges for private connections should have been higher, we recommend that the proposed tariffs be implemented as soon as possible in order to reduce wastage of water.

11.2 National Master Water Plan

11.2.1. We studied the Project Memorandum of the NMWP. It outlines the need and urgency for such a study and the document contains a terms of reference for the plan.

11.2.2 A consultancy team will be assigned to provide the Botswana Government with four different development strategies. The full cost, consequences, merits and constraints of each strategy will be analysed, discussed and presented.

11.2.3 Botswana Government will then assess the document and choose one strategy (or a combination of two or more) from which the country's future water use will be decided. As Botswana's development is entirely dependent on its scarce water resources the NMWP should be prepared as soon as possible.

11.2.4. It is estimated that the total cost of the NMWP will be P4.5 million. The presentation of the first phase (the four strategies) could be available before end of 1990, should the work commence immediately. The final NMWP would possibly be ready one year after.

11.2.5. The evaluation team recommends that SIDA supports the preparation of the NMWP as the study is of utmost importance for the future development of Botswana.

11.3 Lands Area Study

11.3.1. DWA has recently prepared terms of reference for a study, which will look into the water supplies in lands areas, i.e. the small seasonal arable farming settlements between the rural villages. This "Lands Area Study" will consider both the technical and the social factors and concentrate on improving the water situation for the rural poor. It is claimed, although we have not seen evidence of this, that approximately 400.000 people (or 35% of Botswana's population) are presently living in such "lands areas". Traditionally, people move out of their villages to plough in the lands areas when the rains fall around November, and they move back to the villages after reaping their crops in May/June. MOA wishes to encourage permanent settlement at the lands. Councils and MLGL (which have to provide schools, clinics, roads and water supplies) do not generally support a proliferation of new small settlements. The long-running dispute between the two ministries has not been resolved. We recommend that SIDA funds be made available for the Lands Areas Study. We further recommend, however, that SIDA should not become involved in financing the supply of water to arable lands areas until the complex issues relating to the affordability of ever-smaller and less viable settlements in areas without social services have been resolved by the GOB in the context of National Settlement Policy..

APPENDIX A

EVALUATION OF THE VILLAGE WATER SUPPLY PROGRAMME IN BOTSWANA Final Terms of Reference

1. BACKGROUND

Water resources in Botswana are very scarce. they can meet the demand for domestic, public and industrial purposes but are insufficient to meet the demand for large-scale irrigation purposes except in the Okavango, chobe, Limpopo and some other isolated areas. the two main objectives of water sector development are to provide reasonable access to a safe water development supply for the whole population and to provide water supplies to facilitate the achievement of the broad objectives of rural development and employment creation.

Development cooperation between Sweden and Botswana in the water supply sector started in 1971.

By December 1987 Sweden had contributed 178 MSEK and another 52 MSEK for Technical Assistance to the programme. The general aim of the Swedish assistance is to contribute towards raising the standard of living for people in the rural areas. More specifically the objectives are to reduce drudgery for women, assist in the growth of productive employment for Batswana and to improve public health in rural areas.

The cooperation includes three broad sub programmes: construction of rural village water supplies, rehabilitation and operation/maintenance of existing schemes and water hygiene education and sanitation support.

Background notes are attached at Appendix B.

2. PURPOSE OF THE EVALUATION

The purpose of the evaluation is to assess the efficiency and effectiveness of the water supply programme in terms of functioning and utilization of water and in terms of its impact on its users. Based on the results of the evaluation, recommendations regarding the future of the programme shall be made. This should be done in view of the challenges facing the water sector in the future in Botswana such as environmental related issues, manpower requirements and maintenance of the water supply systems and SIDA's policy regarding support to Botswana in general and support to the water sector in particular.

3. SCOPE OF WORK

The scope of work of the Study is:

- To assess the extent to which the Water Programme has fulfilled the objectives for Sweden's support to the water sector.

The objectives of the Botswana/Sweden cooperation in the water sector are: a) to reduce drudgery for rural women; b) to assist the growth of productive employment for Batswana; and c) to improve public health in rural areas and reduce water borne diseases. They include the needs to:

- Cater for the poorest sections of the community
- Maintain existing facilities
- Improve benefits from existing facilities
- Promote economic growth and development in the rural sector as well as Health, Hygiene and Sanitation.
- To assess and analyze the achievements of the programme targets and objectives. Achievements should be measured against inputs supplied by both government and donors. Special aspects to be studied concern programme operation, choice and application of technology, staffing and training. Other aspects to be studied include drilling, transport, water quality, administration and management, operation and maintenance, level of recurrent funding and requirements for upgrading and extension.
- To assess and analyze the programme performance as to the utilization of the water provided. A study of the impact of the programme in a number of villages will be undertaken prior to the evaluation itself to provide data for this assessment and analysis.
- To assess the overall programme in terms of the objectives of the SIDA Water Strategy and Agreed Minutes from Annual Reviews emphasizing Human Resources Development and the Environmental Issues.
- To assess the Private Sector capacity within the water and to recommend on its use for the development of the water sector.
- To make recommendations for continued support to the water sector in view of the water development policy and above mentioned challenges facing the water sector in the future in Botswana and referring to the Swedish aid policy to Botswana in general and to the water strategy in particular.

4. ORGANISATION OF WORK

The evaluation shall be based on basic policy documents such as the National Development Plans, Sanitation Sector Study, Water Administration Study, Eastern Botswana Regional Water Supply Study, Water Law Report, National Migration Study and SIDA project memoranda. Ongoing policy studies such as Water Cost and Tariff Study, Village Sanitation and Tariff Study, Water Design Manual Study and Water Master Plan Study should also be taken into consideration.

A separate study to collect and compile basic data will be commissioned in advance of the main evaluation. This will be undertaken by a local consultant or institution in Botswana. A number of villages which have been provided with water schemes under the Village Water Supply Programme and representing different sizes, locations and ages will be visited and the water schemes thoroughly analyzed as to costs, function, usage and impact.

The evaluation team shall consist of independent persons well-acquainted with water and sanitation issues both within Botswana and from elsewhere.

5. TIME SCHEDULE

- | | |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1988 July | - First Draft of Village Studies report |
| August | - Draft Final report on Village Studies |
| Early September | - Arrival of expatriate part of Evaluation team.
Evaluation Study in Botswana commences.
Joint seminar by the two evaluation teams and steering group. |
| October | - Evaluation Study in Botswana complete
- First Draft of Evaluation Study Report
- Seminar on Findings and recommendations of the Evaluation Study
- Departure of expatriate part of Evaluation Team |

The First Draft Report shall be presented on 4th October 1988.
The Final Draft Report shall be completed on 31st October, 1988.

APPENDIX B

PERSONS INTERVIEWED BY THE EVALUATION TEAM

Ministry of Local Government and Lands

Mr L. Mukokomani	Deputy Permanent Secretary (R & L)
Mr C. Lindblom	Senior Water Engineer
Mr P. Siele	Establishment Secretary, U.L.G.S.
Mr F. Hedwall	In-Service Training Coordinator
Mr A. Sjoberg	Senior Manpower Planner
Mr L. Perera	Staff Development & Training Officer
Ms B. Rathedi	Principal Personnel Officer, U.L.G.S.

Department of Water Affairs:

Mr M. Sekwale	Director of Water Affairs
Mr B. Khupe	Deputy Director
Mr P. Jones	Principal Mechanical Engineer
Mr J.O. Krook	Senior Water Engineer
Mr R. Bergstrom	Senior Hydrogeologist (Drilling)
Mr L. Nilsson	Principal Design Engineer
Mr B. Andersson	Chief Training Officer

Ministry of Health:

Dr. B. Khan	Head, Epidemiology Unit
Ms. M. Tsie	Head of Expanded Programme for Immunisation/ Control of Diarrhoeal Diseases
Ms. B. Mbengwe	Health Educator

NW District, Maun:

Mr E. Letamo	Deputy Council Secretary, NWDC
Mr L. Elvenäs	NORAD Volunteer, NWDC
Mr M. Waterman	Chief Technical Officer, NWDC
Mr E. Moabi	Planning Officer, NWDC
Mr M.D. Patel	Treasurer, NWDC
Ms B. Mmokele	Senior Personnel AND Training Officer, NWDC
Dr J. Byskov	Senior District Medical Officer, NWDC
Ms R. Moremi	Matron, NWDC
Ms B.M. Akuge	Regional Agricultural Officer
Mr B.G. Dithapo	Senior Chief's Representative, Sehitwa Village
Mr C. Maranke	Principal, Gamodubu Primary School
Ms N. Gabarongwe	Family Welfare Educator, Gamodubu Clinic

Southern District, Kanye:

Mr R. Chikuba	Council Secretary, SDC
Ms G.K. Tselaesle	Senior Personnel and Training Officer
Mr G Mauleke	Public Health Inspector, SDC
Mr W.A. Beales	Chief Technical Officer (Works), SDC
Mr K.P. Bhangui	Chief Technical Officer (Water), SDC
Mr M.E. Gaedie	Principal, Modisi Primary School, SDC

Kweneng District, Molepolole:

Mr M. Siwela	Technical Officer (Water) Kweneng DC
Mr. V. Olesitse	Senior Technical Officer, Kweneng DC
Mr M. Matabathe	Council Planning Officer

SIDA:

Ms L. Laurin	Head SIDA-Botswana
Mr. L.O. Hook	Programme Officer (Water)
Ms. I. Lofstrom-Berg	Programme Officer (Health)

APPENDIX C

ITINERARY FOR THE EVALUATION TEAM

Thursday, September 8, 1988:

Arrival in Botswana of the two Swedish members of the team. Discussions with DCO/Swedish Embassy.

Friday, September 9

Seminar on draft report "Socio-Economic Effects of Village Water Supplies in Botswana".

Saturday, September 10

Seminar continues

Monday, September 12

Meetings with officers of MLGL.

Tuesday September 13

Departure for Maun, North-West District. Discussions with officers of the District Council.

Wednesday, September 14

Discussions continue.

Thursday, September 15

Field visits to Sehitwa and Tsau village water supplies.

Friday September 16

Visit to a SIDA-funded Schistosomiasis Control Project

Sunday, September 18

Departure for Gaborone

Monday, September 19

Field visit to Molepolole, Kweneng District.

Tuesday, September 20

Field visit to Kanye, Southern District.

Wednesday, September 21 - Monday October 3

Report writing and more discussions with Government officers and representatives of donors, NGO's and private sector.

Tuesday, October 4

Presentation of draft report

Departure for Sweden by the two Swedish members of the Team.

APPENDIX D

ABBREVIATIONS USED IN THE REPORT

CTO	Central Transport Organisation
DDC	District Development Committee
DDF	Domestic Development Fund
DWA	Department of Water Affairs
FWE	Family Welfare Educator
MFDP	Ministry of Finance and Development Planning
MLGL	Ministry of Local Government and Lands
MMRWA	Ministry of Mineral Resources and Water Affairs
MOA	Ministry of Agriculture
MOE	Ministry of Education
MOH	Ministry of Health
SIDA	Swedish International Development Authority
WMU	Water Maintenance Unit
WUC	Water Utilities Corporation

APPENDIX E

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TABLE 3

IN-SERVICE TRAINING FOR COUNCIL WATER STAFF
 (from SIPU Progress Report 1988-07-16)

COURSE	GROUPS OF PARTICIPANTS								FIRST IMPL.	
	BO PF	APF	ABM	SO	TA	STA	TO	STO CTO WE		
1. Maintenance of Vil.	X				X				Dec 88	
2. Pipe laying and pi.	X								Mar 89	
3. Refr. pipe laying.	X				X				Sep 89	
4. Refr. engines/pum.			X		X	X			Nov 88	
5. Trainer's course.				X	X	X	X		Nov 88	
6. Instructor's cours.			X	X	X	X	X		Feb 90	
7. Adm. and paperwork..	X		X						Apr 89	
8. Adm and managemen.				X	X	X			Okt 89	
9. Metalworks.	X	X		X	X				Nov 89	
10. Electrical instal.				X	X				Nov 88	
11. Advanced administ.						X	X	X	Feb 90	
12. Mechanical Engine.						X			Mar 90	
13. Civil Engineering.						X			Apr 90	
14. Accounting and st.							X	X	Feb 89	
15. Technical drawing.							X	X	Mar 89	
16. Supervision							X	X	X	Feb 90
17. Tender proceedure.							X	X	X	Sep 90
18. Advanced planning.							X	X	X	Okt 90
19. Individual planne.							X	X	X	Mar 89

Basic education requirements- pensionable staff

The table below shows the number of positions and vacancies within the public water sector:

Table: Present staff with water-related tasks; number of positions minus vacancies at different levels

Entrance requirement	Salary scale	WUC pos-vac	DWA pos-vac	MLGL pos-vac	TOTAL pos-vac
(technical)					
M.Sc.	≥ PR 2		19- 3	1- 1	
B.Sc.	≥ PR 4		22- 6	1	
Diploma	≥ T 3		104-13	28-10	
Certificate	≥ T 5		<u>122-33</u>	<u>44-16</u>	
Sub-total			<u>267-55</u>	<u>74-27</u>	
(administrative)					
B.A.	≥ GA 3		7- 1		
Certificate	≥ GA 6		<u>69- 1</u>		
Sub-total			<u>76- 2</u>		

Sources: Vacancy-reporting from WUC, DWA and MLGL

The situation has improved generally during the 1980s. For example the vacancy rate for all council positions was 8.9% in 1987/88 (350 out of 3,890 posts) while it was some 30% in 1981/82 with a total staff of only 2,811 at that time. As for the technical staff above the vacancy rate is just above 30 percent. There are two expatriates in ULGS HQ working in the water sector and four in the districts. The vacancy rate will drop if the district DWA staff is transferred or seconded to the councils.

In DWA the improvement in staffing has been impressive. The vacancy rate varies between 10 - 25 percent. At present there are 13 expatriates working for DWA. This number will decrease substantially, as will the vacancy rate, now that much of the siting, drilling and design activities are performed by private contractors.

In order to appraise the staffing over the next few years, we have compiled some information about the ongoing training activities in DWA and ULGS. There is at present a large number of students enrolled in formal training in Botswana and outside. They will join the job in a few years time. The figures for MLGL/council include trainees who will join different departments like Works Dept, Water etc. The table below indicates the numbers of trainees suggested for training 1988/89 in different fields:

Degree	DWA				MLGL/councils						
	D&C+hydr+eng		civ	lab+others	plan	adm	fin	tech	educ	com	dev
Outside:											
Master		1	2		5	0	1	0	0	0	1
Bachelor			4		0	0	0	2	0	0	4
Higher Dipl			4		0	2	6	8	0	0	0
Diploma			-		0	5	0	2	0	0	0
In Botswana:											
Bachelor			-		0	6	3	0	3	0	10
Diploma			11		0	0	10	2	5	0	10
Certificate	4+	5	3+	2+ 8	0	21	11	7	0	0	15
Total	4	6	24	2 8	5	34	31		8	0	40

A brief overview of the envisaged time spell before all vacancies are filled, may now be hinted at. We may assume that the present positions reflect actual crude needs for manpower of different levels of formal education. We may further assume that some 5-10 percent of the positions are vacated annually due to retirement, resignation etc. The overview below takes into account only formal education. Certainly job experience may be as important, especially for the higher positions. Fortunately the report from the presidential commission 1987/88 has dealt with this and recommended a time-table for localisation.

Bachelor and Master in Science: Today civil engineering education is not available in the country. At present some ten students from DWA are abroad for studies at B.Sc. and M.Sc. levels. Most of them are due to return under 1989.

University of Botswana has a B.Sc. study programme in geology and hydrogeology which provides some of the needed professionals. One such student is returning to DWA in 1989 to take up a position as Assistant Hydrologist (PR 4).

At present ULGS has no one from the water sector studying at this level, but there are a few in sanitation and civil/mechanical engineering. The occasionally needed manpower may be obtained through buying the services from DWA. ULGS is also looking for consultants to design a training programme to upgrade council water technicians to the water engineer level. Such a step has to be investigated thoroughly. The quantitative need for water engineers is very small, especially at district level, where the O&M (and extension) of water and sewerage installations do not require degree qualifications.

Diploma: Twelve DWA-sponsored students are returning from studies within 1988/89. This year eleven trainees from DWA are among the 16 students enrolled at Polytechnic for the Water Engineering Technician course. At the end of this year 10 WET-students return to DWA and ULGS with such a diploma. Moreover there are some DWA and MLGL students studying other Diploma programmes at Polytechnic.

Three TA-staff from ULGS will study for a Higher Diploma in Water techniques in Kenya, and two for diploma in Community Water Supply and Sanitation in the UK. It seems reasonable to believe that the Diploma-posts will be filled within a few years.

Certificate: Let us take the case of Technical Assistants (TA) earning T3/5. There is a need to recruit some 10-20 each year as replacement. Also the present backlog of some 50 TA has to be catered for. At present DWA is conducting a two-year departmental training for some 15-20 trainees aspiring for TA positions in hydrology, water quality, groundwater and design.

Also there is a four-year Country Apprentices training programme using a combination of VTC-based training and on-the-job training as rig mechanic etc. Some 20-30 with Junior Certificate may enrol in order to qualify as TA after four years.

Already these two programmes will alleviate the shortfall of TA's within four years. With the proposed amalgamation of the present DWA staff in the districts with the councils' water units, self-sufficiency in staff will be attained earlier.

Administration: According to the figures in the table almost all positions within the administrative cadres are filled.

We have seen above that the basic education offered in Botswana can cater for almost all needs with the exception of higher civil engineering education.

In Table 3 is shown the present plan for in-service training for council water staff. It is easily seen that the TA and TO staff will have access to some 4-9 courses in a little more than a year's time.

