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**REVIEW OF WATER SUPPLY SITUATION
AND ASSOCIATED ISSUES
IN HERERO REGION, NAMIBIA,
18-21 SEPTEMBER 1990.**

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September 1990

824-NA. Hego-8107

ACKNOWLEDGEMENTS

The author would like to thank the Dept. of Agriculture for facilitating the consultancy mission. Particular thanks are due to Mr J.Esterhuizen for organising the field trip itself and ensuring its success, and to all government officers and community members in Herero Region who spared their time to attend meetings and answer the consultant's questions.

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ANNEX 1: WATERPOINT MEETINGS

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I. INTRODUCTION

1. A four-day mission was undertaken-between 18-21 September, 1990, to review UNICEF support to the Emergency Water Supply Project in the Herero Region, Namibia. The mission team was made up of P.Evans, UNICEF consultant, and J.Esterhuizen, of the Ministry of Agriculture, Windhoek.
2. This report summarizes the principle findings and recommendations of the UNICEF consultant.

II. BACKGROUND

3. Herero Region is situated in the north-east of Namibia, bordering Botswana on the edge of the Kalahari Desert. The region covers a ground area of approximately 4.5 million hectares, with an estimated population of about 30,000. The principle means of livelihood is stock rearing, with cattle being the major stock, supplemented by sheep, goats, and horses. The population is highly dispersed, living in small clusters around water points.
4. The objective of the former Administration for Hereros, and of the current government, is to settle the people on farm units of approximately 5000 hectares, each supplied with a motorized borehole water supply. At present approximately 37% of the available land (1.7 million hectares) is unsettled, due in large part to lack of water supplies, and to the presence of "poison leaf" (*Dichapetalum*) which severely handicaps stock rearing. In general, the Herero Region is very suitable for stock rearing, if properly managed. In addition to water supply and poison leaf problems, however, overgrazing and the absence of fencing on many farm plots have contributed to underdevelopment and environmental stress.
5. During the transitional period to Independence, an inspection tour of water points in Herero was undertaken by Australian engineers from UNTAG. The UNTAG team found a large proportion

of water points in poor repair, largely due to inadequate maintenance of engines.

6. In response to a request from the Ministry of Agriculture, Fisheries, Water and Rural Development, UNICEF has provided 38 Lister diesel engines to assist in the rehabilitation of water points. In total, the Ministry is replacing 65 engines throughout the region, partly from its own resources, with additional help from UNICEF and UNDP.

III. WATER SUPPLY SITUATION

7. The provision of new engines for boreholes in Herero has undoubtedly been of great assistance to farmers in the region, enabling them to have greater confidence in their source of supply. Fundamental problems of maintenance and long-term sustainability remain, however, and further significant inputs will be required by government and external support agencies, as well as by communities themselves, before a fully effective system can be said to be in place.
8. Herero is an extremely arid region, largely unsuitable for crop farming. The potential for stock raising is good, but depends on careful husbanding of resources and adequate water supplies. The dependence of the Herero people on stock rearing makes water supplies crucial not only to basic health, but also to the economic viability of the region. The primary interest of the people in water supplies is in regard to stock watering. If water supplies are only adequate for domestic consumption, settlement in the area is likely to be unviable. In this respect water supply should be seen just as much as an economic necessity - and a resource which has direct economic benefits - as a basic welfare need. The availability of water not only enables people to settle the land, but also enables them to generate income from the rearing of stock. The economic significance of water supply in the region is of great importance in analysing the situation in Herero and bears on policy issues of cost recovery, operation and maintenance, and community self-help.
9. As noted, less than two-thirds of the region's land area is settled, largely due to the current unavailability of water supplies. Opening up new areas to settlement is hampered, however, by the very high net cost of boreholes due to the high failure rate experienced in drilling operations. In the Eiseb Block area of Epukiro Division, for example, the Dept. of Water Affairs was only able to achieve a success rate of 25% in its drilling operations. Elsewhere in the region success rates in excess of 40-50% are extremely rare. Water is hard to find, and in many cases is found with high saline content, making it marginal for human consumption.

10. The current policy of the Dept. of Agriculture is to settle farmers on designated blocks of land, measuring approximately seven kilometres on each side, giving a land area of close to 5,000 hectares. This is considered adequate to support between 500 and 600 cattle without risk of overgrazing and environmental degradation. Some success has already been achieved in introducing this pattern of settlement, particularly in the Okakarara and Rietfontein Divisions, but the ideal is still far from being realised in the region as a whole.
11. The water supply situation is a constant source of worry to Dept. of Agriculture extension workers and demands a considerable amount of staff time, often at the expense of other agricultural extension activities. Among the Herero population, particularly the men, it is an almost obsessional interest. During the mission's visit community groups showed little interest in discussing anything else.
12. The basic source of water supply in the region is motorized boreholes, of up to 300 metres in depth. Handpumping is unviable, both because of the depth of boreholes and the amount of water which is required each day from water points for both domestic use and stock watering. Water points, by rural African standards, are therefore quite sophisticated. A typical water point will consist of a fenced enclosure containing a motorized borehole, with the engine kept in a shed, a large storage tank (of about 50,000 litres capacity), and a stock watering trough. Most water points have a separate standpipe for drawing domestic supplies.
13. In the past, the administration met all the costs of constructing and maintaining these water points. Since 1988, however, with the beginning of the transition to Independence, the responsibility for basic operation and maintenance has been passed to the users. Communities are now expected to buy their own fuel and spare parts for the borehole engines. The government continues to take responsibility for new water point development, the maintenance and repair of boreholes themselves, repair work on engines with spares provided by the community, and the employment of engine operators ("pumpers") at each water point. Government budgets for operations and maintenance are extremely tight and at present the Dept. of Agriculture receives no budget allocation for the purchase and provision of spare parts. Fuel costs for an average borehole are about R.500 per month.
14. Having previously received a completely subsidized service, the local population does not feel particularly happy about taking on this financial burden. On the other hand, given the size of stock holdings in the area, it appears that many of them can afford to pay. This is particularly so when one

realises that the fuel costs of running a borehole for a month is a little more than the market value of one cow - while many boreholes are providing water for up to 1,000 cattle each day. Apart from water supply, capital inputs to cattle rearing in the region are almost negligible. Though many individual farmers would find it impossible to maintain a water point on their own, groups of farmers sharing a water point seem to manage quite well, provided that they have worked out an effective local management system among themselves. The effectiveness of local management systems varies, however, from place to place.

15. At present, many farmers in the region seem intent on campaigning for a reinstatement of government provision of water point running costs. Such an approach is likely to be highly unviable in the long-term, and arguably unnecessary in view of the economic benefits gained by the local population from the capital inputs already provided by government, not to mention the significant subsidies entailed in the provision of a free repair service and the employment of pumpers.
16. Talking to farmers, it was evident that most had little idea of what was already being spent by government to help maintain water supplies, and what the financial implications would be of returning to a fully subsidized approach. The current Dept. of Agriculture annual budget for Herero of R.3.2 millions would need to be multiplied by a factor of two or three at the very least if a full service was to be provided by government. The provision of such a service is also likely to have implications for the rest of the country where much more basic water supply provisions are currently in place.
17. The uncertainty surrounding policy is exacerbated in the Okakarara Division by the free provision of water to about 50 7km x 7km farm plots from the Eastern Water Carrier pipeline. This is fed from a canal running from Grootfontein to Okakarara, where the water is treated and then run by gravity down a 60 cm. pipeline, with several smaller diameter sidelines running off it. A second pipeline also provides free water supply between Okakarara and Coblenz. In the western part of Okakarara ground water has a high salt content, making it unsuitable for human consumption. The government is

currently providing a free tanker delivery service for drinking water supply to affected areas. Thus, while many people in the west and north-east of Okakarara are receiving free water supplies, those in the central, east and southern parts of the division, and the rest of the Herero Region, are having to pay the basic running costs of borehole supplies.

18. During the review mission, water points which have been provided with new engines by UNICEF were visited. A total of eight water points were seen, and community meetings held at each. A meeting was also held at Epukiro with local chiefs and headmen. Summaries of the discussions held are given in Annex 1. UNICEF has provided 38 engines for use in Herero. The field visit can hardly be said to constitute an exhaustive study of the area, but more a means of gathering impressions and giving some members of the population an opportunity to air their views. A great deal of time during the mission was spent in driving from one place to another, often over extremely bad roads. The highly dispersed settlement pattern in Herero, and the difficulties in moving easily from place to place, are in themselves factors bearing on development issues in this region.
19. Most, though not all, of the UNICEF funded engines had been installed by the time the mission was undertaken. The speed with which they were delivered to site and put into operation is in itself evidence of the urgency of the need for this assistance. In general, the installation of the engines was found to be satisfactory, though some were only temporarily mounted. Two of the engines seen had suffered breakdowns very soon after installation. According to community members, this was because they were not heavy-duty enough to cope with the pumping requirements of some of the deeper boreholes. This problem will require monitoring and further technical investigation. According to the Dept. of Agriculture, new engines were allocated to water points on the basis of two principle criteria: the condition of the existing engine, and the number of livestock supported by the water point.
20. The primary emphasis in the community meetings was placed on community management systems, which are the basic key to the long-term viability of the current approach to water supply provision in Herero.

IV. WATER POINT MANAGEMENT

21. The local management of water points has been left largely in the hands of the communities themselves. On a day-to-day basis, community groups are responsible for providing fuel for the running of the engines, and for buying spare parts in the event of breakdowns. The efficient running of the engines

also depends on the regular replacement of air filter elements and oil filters. These require replacement at approximately monthly intervals. In a typical month, a borehole engine will require two to three 200 litre drums of diesel, a few litres of oil, and a replacement air filter element and oil filter. The average cost to the community is thus in the region of R.500 to R.750 per month. Breakdowns obviously require larger inputs, with the costs increasing with the age of engines when more frequent repairs are likely to be needed. Engines appear to have a life span of about 10 years before needing replacement.

22. Although a few water points are managed by single-household big farmers, most are shared by groups, varying in size from three or four to in excess of 20 households. Typically, stock holdings within groups vary considerably, with one farmer often dominating the group. In many cases, the dominant farmer is the leader, holding the position of post foreman and taking responsibility for local organisation. In some cases, where no single farmer is dominant, groups organise themselves without a clearly acknowledged leader, or follow traditional leaders in water point management.
23. To the outsider, the most equitable way of sharing costs for the water point would be by the division of contributions on a *pro rata* basis, linked to the relative size of stock holdings of each member of the group. This system was noted during the mission, but variations of approach were seen, even within the small sample of water points visited. Four basic models were observed, as summarized in the table overleaf.
24. Where neighbours come to water their stock, due perhaps to breakdowns or insufficient supplies at their own water points, they are usually, but not always, asked to make a contribution to running costs, often in the form of fuel.
25. At some water points, contributions are collected in cash by a designated member of the group. This may be the same person every time, or members may take the responsibility in turn. At others, members make their contribution by purchasing and delivering their own share of the fuel. Some community groups admitted to having problems in managing the water points, particularly where no account was taken of relative stock holdings in dividing costs. Groups often had to cover for each other when one or another member was unable to contribute at any particular time, and what are probably quite complex debt relationships seem to develop. All of the water point groups visited said they kept written records of members' contributions. Group members often own vehicles, and these are used to collect fuel and spares. The distances travelled may be up to 100 or so kilometres each way to obtain fuel for the

more remote posts. Distances in excess of 300 kilometres may be travelled to obtain spare parts.

WATER POINT COST SHARING MODELS

- a) Fuel costs and repair bills shared on a *pro rata* basis.
 - b) Fuel costs shared on a *pro rata* basis, but repair bills divided equally on a per household basis.
 - c) Fuel costs divided equally on a per household basis, but repair bills divided on a *pro rata* basis.
 - d) Fuel costs and repair bills shared equally on a per household basis.
-

26. There was no evidence at any of the water points of fuel or spares being stockpiled, and it appeared that groups would buy one drum of diesel at a time, and only buy spares as and when required. To an outsider, this appears to be an extremely inefficient approach to management, with lengthy journeys (and often cash collections) having to be made every two weeks or so in order to keep the engine running. Occasional difficulty in obtaining spares is also a problem.
27. Knowledge of basic maintenance procedures among pumpers, and among community groups, varied considerably. This was particularly true in the case of filter replacement, with some pumpers and groups being well aware of the required procedures, and others appearing ignorant. It is doubtful that these routine maintenance procedures are closely followed throughout the region, and this clearly will have an effect on engine life and long-term maintenance costs. Pumpers, usually recruited from the community, are trained by the Dept. of Agriculture and paid a basic wage of R.80 per month. A high turnover of pumpers means, however, that knowledge and ability varies greatly. One or two of the pumpers met were evidently not well versed in routine maintenance procedures.

28. The water points in the Herero Region have been established to a high standard, with good quality fencing, sturdy engine sheds, and well-made storage tanks and watering troughs. Community care of the water points, however, seems to vary a great deal. Some of those seen were well kept and tidy, while others were far more ramshackle, with simple problems apparently not being attended to. While Herero farmers, as much out of necessity as any desire for self-sufficiency, appear to have accepted their responsibility for running borehole engines, this has not necessarily extended to a sense of general responsibility for the water point as a whole.
29. At some water points fences had fallen into bad repair, and small leakages were seen at valves and tanks. In one or two cases, pipes were in need of replacement. In relation to the overall running cost of water points, most problems seen were minor and could be fixed by either the provision of low-cost replacement parts, or simple handyman skills. In many cases these problems were pointed out to the mission by community members themselves, in the apparent expectation that they would be attended to by external agencies.
30. These findings indicate that a concept of community ownership or responsibility for water points has not as yet taken hold. Many groups were clearly hoping that community payment for engine running costs was only a temporary necessity and that government would step in and take over this burden. All community groups met asked for help with the provision of diesel and spare parts.
31. In summary, the mission found that:
- * there was great variety in local management systems, and in group members' levels of satisfaction with local arrangements;
 - * there is scope for improving the efficiency of local management systems;
 - * long distances are routinely travelled to obtain fuel and spare parts;
 - * knowledge of routine maintenance requirements varies greatly;
 - * spare parts are not always available, and are usually far away;
 - * the general sense of self-reliance at water points is low.

- * in broader terms, more water points are required throughout the Herero Region both to allow the opening up of new farm lands and to increase water availability at many existing farms.

V. OTHER DEVELOPMENT NEEDS

32. Water supply undoubtedly constitutes the most basic development need in the Herero Region, and this was strongly reflected in the discussions with community groups. All the groups met were entirely made up of men, and this may well have affected the development priorities they expressed. At the same time, adequate water supply, for both human and livestock consumption, is a clear prerequisite for settlement in Herero, not to mention economic advancement and development. With the exception of those who obtain water from the Eastern Water Carrier pipeline in Okakarara, almost all of the Herero population depends on motorized borehole supplies. Surface water supplies are non-existent for most of the year. This dependence makes for a precarious existence, particularly when the water table drops during periods of drought, and when boreholes break down.
33. The remote and dispersed settlement pattern typical of the Herero Region makes the provision of basic services very difficult, a problem made worse by the poor state of repair of the roads. There are no tar roads in the Herero Region at all. Access to clinics and schools is difficult for most of the population, with many people living 50 kilometres or more from the nearest services. In emergencies this obviously places the population at great risk. The need for more clinics and schools was acknowledged by all community groups met. The development of mobile clinic services, or even a flying doctor service, would be a major step forward.
34. The advantage of using motorised boreholes and piped supplies is that the population has the benefit of a clean water supply. Unlike other regions where water is typically taken from unprotected surface or groundwater sources, most water for domestic consumption in Herero is clean at source. General sanitation conditions, on the other hand, are poor, with virtually no latrines evident in the rural areas. Easier access to curative health services, linked to the development of vigorous preventive health campaigns are a clear need in this region, as elsewhere in Namibia. Water points could be used as focal points for the development of preventive health campaigns, given their crucial practical and symbolic significance for the basic survival of the local population.
35. Apart from water supply deficiencies, another obstacle to economic development in the Herero Region is the presence of

poison leaf. A means of eradicating this nuisance has not yet been found, but improved fencing of farms and better livestock control may help to reduce its further spread until a more permanent solution is found.

36. The future development of the Herero Region will clearly be a complex process, requiring the coordinated efforts of all involved government and donor agencies, and a significant increase in the levels of self-reliance among the people.

VI. RECOMMENDATIONS

37. A number of specific developments appear to be required in the short and medium term to improve water supply management in the Herero Region, accompanied by long-term interventions in respect of both water supply and other health and welfare issues.
38. **Water Point Management:** Community management of water points could be improved in a number of ways. A prerequisite for such improvement, however, is the announcement of clear and unambiguous policy statements as to the respective responsibilities of government, on the one hand, and community members, on the other. Current efforts by extension workers are being hampered by the lack of clear direction, and by the high expectations within the community that government will resume full responsibility for water point operations and maintenance.
39. At present, local organisation for water point management is left entirely in the hands of the community. Though this is desirable in principle, and works well in practice at many water points, there is a danger nevertheless of weaker members of the community being disadvantaged as a result. Where *pro rata* systems of cost sharing are in operation, communities seem to be generally happy with local arrangements (apart from the reservation that all would be happier if someone else were paying for the service !). Within a very small sample of water points visited, however, it was seen that not all community groups operate in this way. It may be desirable, therefore, for the government to prepare a model framework and guidelines for the establishment of water point committees for local management, based on whatever policy principles are established. UNICEF could provide assistance in framing up draft guidelines and developing a community training programme to assist community groups in putting these into action.

40. Community training should include:

- * the roles and responsibilities of community water point committees, and how to set one up;
- * guidance on how to establish and manage cost sharing on an equitable basis;
- * how to keep simple, appropriate written records of contributions and running costs of borehole engines;
- * a basic briefing on the standard preventive maintenance needs of borehole engines, and the importance of keeping to a regular maintenance schedule;
- * the advantages of bulk purchasing of fuel and spares, and associated stock control;
- * procedures to follow in the event of breakdowns;
- * general care of the water point and surroundings;
- * health-related issues concerning water and sanitation, and the hygienic care of the water point.

41. **Improved Maintenance:** There is clearly room for improvement in the basic maintenance of engines, and water points in general. Some maintenance issues can be covered under the community training programme, but more frequent refresher training of pumpers, and closer inspection of their work by extension workers would assist in prolonging engine life and keeping water points in generally good order. Given the relatively high turnover of pumpers it is also of great importance that basic maintenance procedures, particularly in relation to the regular replacement of air filter elements and oil filters, are effectively communicated to water point committee members or, at the very least, to post foremen.

42. As further assistance to improved maintenance, consideration should be given to the establishment of spares stockpiles at divisional centres. These would consist primarily of stocks of air filter elements and oil filters, and perhaps a selection of the most frequently needed spares, such as gaskets, piston rings, and so on. An approach could be made to UNICEF for the establishment of initial stockpiles, which could then be sold on to water point committees at cost and replenished from the income generated. The management implications of such a scheme

would have to be investigated by the Dept. of Agriculture, but the development of stockpiles would help to ensure that standard spares are readily available within a reasonable distance of water points. The government may also be able to obtain spares at lower cost by buying in bulk from suppliers.

43. The establishment of an engine and borehole monitoring system might also assist the maintenance programme. Extension workers could maintain a water point register in which running cost and breakdown data recorded by water point committees could be entered. This would enable the Dept. to identify basic problems in water point management.
44. At present, water point management seems to be an exclusively male preserve. Greater involvement of women, who have a great interest in water supply not just from a domestic point of view but also through their own involvement in stock holding, may help to improve general standards of maintenance and use. Ideally, each water point committee would include women among its members. If this were not acceptable to the community, separate women's users groups could perhaps be formed as focal points for health and hygiene education activities and improvements to the hygiene of water points in particular, as well as general environmental sanitation improvements. Such activities could be closely tied in with the Dept. of Health's work in developing a Primary Health Care approach in the country as a whole. The promotion of a self-help building campaign for improved latrines could form an important part of such a programme.
45. In the interests of equity across the region as a whole, and as a means of recovering costs, the government may wish to consider introducing a basic service charge to communities in Okakarara currently receiving water supplies free of charge from the Eastern Water Carrier. In view of the economic advantages to be gained from water supplies in Herero, this may not be viewed as unjust or unreasonable. Charges for rural water supplies are harder to justify when they constitute a basic welfare necessity, but this is only partly true in the Herero case. In many respects, residents of the Herero Region can be said to gain a definite financial advantage from the provision of water supplies by government and it may not be unreasonable therefore to expect some form of payment in return. The raising of revenue in this way could be fed back into the general maintenance programme, and help finance the recurrent costs of government maintenance teams.
46. In the longer term, more boreholes are required in Herero Region to allow unutilized land to be settled, thus easing the pressure on the land in currently settled areas. Given the depth of ground water sources in the region, and the low success rate in drilling programmes, a sizeable capital

investment programme will be required to meet this goal. Steps should be taken to identify a major donor with an interest in rural water supply who may be willing to support such a programme. The establishment of clear policy guidelines for the management and long-term sustainability of water points is likely to be a prerequisite for the winning of such support.

47. The borehole programme could be supplemented by the development of an earth storage dams project, to harvest rainfall and runoff during the rainy months and ease the pressure on pump engines.
48. In general terms Herero will need to be considered, along with all other regions, in the overall development and extension of education and health services. The highly scattered pattern of settlement in Herero, though no means unique in Namibia, is a significant disadvantage as far as basic service provision is concerned and has a particular impact on per capita cost levels. Nevertheless, easier access to health facilities and to schools is essential to long-term development. As noted, government may wish to give consideration, at the very least, to the establishment of a mobile clinic service, or even a flying doctor service, for the Herero Region.

ANNEX 1
WATERPOINT MEETINGS

ANNEX 1
WATERPOINT MEETINGS

- A.1 Meetings were held at eight water points during the field trip, with two water points being visited in each of the four divisions visited. A meeting with chiefs and headmen was also held at Epukiro, on the last day of the mission. Summaries of the discussions held at each meeting are given below.

Okakarara Division

Ohamuheke #2 & #1

- A.2 Due to a communications problem, the team arrived at Ohamuheke and found community members waiting at Ohamuheke #2. The water point we wished to inspect was at Ohamuheke #1, some five kilometres away. It was agreed, therefore, that we would inspect #1, and then return for a meeting with the community at #2. We were accompanied to #1 by the pumper.
- A.3 The waterpoint at Ohamuheke #1 was established in 1981, and a new UNICEF-supplied engine had been installed a little more than a week before the visit. The waterpoint serves three families (approximately 16 people), and provides water for about 1000 head of cattle. The site was well-fenced, with the engine pumping to a storage tank of about 50,000 litres capacity, and running into a large cattle watering trough. A separate tap was provided for community drinking water. The storage tank was full, and the pumper reported no problems with obtaining sufficient supplies for each days use.
- A.4 The previous engine was said to be in very poor repair, and was burning a lot of oil. The new engine was much better, and cheaper to run. The increased pumping power of the new engine meant that the water now had a reddish tint from the soil type. It was expected, however, that this would clear after a few more days pumping. The water was still palatable in spite of this. The engine was run for about five and a half hours per day. The pumper was well-versed in starting and running the engine, but appeared to have a low awareness of routine maintenance procedures, particularly the need to regularly replace the air filter element and oil filter. No spare filters were held in stock. The exhaust outlet pipe did not fit properly to the engine and as a result there was some leakage of fumes into the engine shed.
- A.5 The old engine had completely broken down, and was out of action for some weeks before the new engine was installed. During this time, water was drawn from Ohamuheke #2, the nearest available water point.
- A.6 At Ohamuheke #2, a community meeting was held with a group of 13 men. No women were present. This water point serves nine households and about 2,500 head of cattle. The engine here was said to be in generally good repair, though people said they had difficulty in meeting running costs. The management of the water point was undertaken by the household heads as a group, under the leadership of the post foreman. Money for fuel and spares was collected on an as required basis, with households paying a

share for fuel in proportion to their stock holding, and sharing repair costs equally, irrespective of individual herd sizes. Written records are kept of all contributions. The group estimated that they spent about R.460 per month on diesel fuel.

- A.7 The community members said that cooperation between them was very good, and none complained about the local management system which had been developed. The group allowed their neighbours from #1 to use their water free of charge during the recent engine crisis, in the expectation of similar reciprocal help if the need arises.
- A.8 The group said they were hoping they would get more help in future to run and maintain the water point. Help was particularly required in obtaining spares. Many engines in the area were old and needed replacement, as did a lot of the piping. The group said that they always found it hard to raise the money to buy diesel (in spite of a sizeable stock holding), and hoped that the government would be able to provide diesel free of charge. Additional problems included bad roads, poor housing standards, lack of clinics and schools, shortage of grazing for livestock, and difficulties in obtaining extra feed.

Okakarara Division

Otjumupanda

- A.9 At Otjumupanda a meeting was held with 20 community members, again all men. The group was led by a middle-aged man who was clearly very affluent by local standards, with a well-built house with its own generator for electricity supply and a large livestock holding.
- A.10 A UNICEF-supplied engine had recently been installed, replacing an old engine which had been giving constant problems. With the old engine, fuel bills were running at about R.1,000 per month. The new engine was much cheaper to run. People contributed to the running of the engine according to their ability to pay. It was clear that ability to pay varied greatly. All those present said they were happy with the way in which contributions were managed.
- A.11 Although the group expressed satisfaction at being provided with a new engine, and appreciated the fact that the mission team had taken the trouble to come and meet them on site, they pointed to a number of other problems in relation to the water supply.
- A.12 When fully operational, the supply is pumped into two storage tanks, adjacent to each other, and from there into a cattle watering trough. At present only one of the tanks was in use due to a breakage in one of the pipes. The valves on the pipes were also in poor condition and leaked. The group requested that help be given in making the necessary minor repairs. Some of the fencing around the water point was also in need of repair.
- A.13 In view of the fact that a fairly substantial outlay was required to keep the engine running from day to day, and that the community had clearly managed to sustain this for some considerable time, it was a little surprising to hear requests for assistance for what were obviously very minor repairs. Although the community had accepted that they must pay to

keep the engine running, this self-reliant attitude did not seem to have extended itself to the rest of the water point. The group seemed to be waiting in the hope that the government would take care of what are basically routine maintenance problems around the water point in general.

- A.14 Although several of the families represented in the group lived near to the water point, several others were some distance away, and it was asked whether pipelines could be constructed to carry water to standpipes nearer to peoples homes. House-by-house connections were not required, but a number of satellite water points would help greatly, particularly for old people who currently had to depend on others to carry water home for them. Again, the community expectation was that the government might be able to help with the necessary capital investment. There was some hesitation when the question was put as to whether or not the community was willing to pay more for an improved service, though the group leader said it was certainly something they were willing to discuss. When pressed, the group said they were prepared to take care of the facilities, once installed, to stuck to the belief that capital inputs and major repairs should be undertaken by government.
- A.15 Otjumupanda is located some seven kilometres from the Eastern Water Carrier pipeline, which provides water free of charge to some 50 plots to the north. Another community proposal was that a line be run from the pipeline to provide a second supply of water. This would relieve the load on the engine, and provide a back-up service in times of drought.
- A.16 The general problems expressed by the community all related to the drought. Grazing was currently very poor, and it was difficult to obtain feed and alternative grazing sites. Any help would be appreciated, such as extra feed, or the making available of temporary grazing facilities in the commercial farming areas.

Otjinene Division

Omungondo

- A.17 Water at Omungondo was provided by two boreholes, about half a kilometre apart, both pumping into a single storage tank. The boreholes are known as Haramse A and B. One of the boreholes had a new, heavy duty engine which had been paid for by the community, while the other had recently had a new UNICEF engine installed. This was not yet in use, due to a breakdown in the borehole itself. This was under repair by the regional maintenance team during the mission's visit.
- A.18 The boreholes were both very deep, in excess of 800 feet each. The water supply provides for 15 households and between 800-1,000 livestock. Fuel costs to run both engines were estimated by the group to amount to about R.1,000 to R.1,200 per month. The group met regularly under the leadership of the headman to agree household contributions. Rather than contributing cash, each household was responsible for providing diesel fuel in turn. Contributions were made roughly in accordance with livestock holdings, with poorer households contributing less fuel than richer ones. Records were kept of contributions made. The system worked reasonably well, although there were quarrels and misunderstandings from time to time. The group said they did their best to adhere to regular maintenance schedules,

and tried to replace filters on a monthly basis, though this was not always possible. The group was generally satisfied with the work of the pumper, though they said he could do with a little more training, particularly on how to fix breakdowns.

- A.19 In spite of being supplied by two boreholes, the group said that flow of water was very slow and it was often the case that the water produced was insufficient to meet the community's needs. The boreholes sometimes run dry, and it is necessary to stop pumping for a while until they recharge. The borehole supplied with the UNICEF engine had been out of commission for about a month, and during this time it had been necessary for people to take some of their cattle to other watering points at neighbouring farms and ask for help, and to bring drums of drinking water into the area by vehicle. Water was by far the biggest community need, according to the group, and a further borehole was required to ensure adequate supplies. Other needs included schools and clinics, both of which are far away.

Otjinene Division

Otuindjo

- A.20 At Otuindjo, a UNICEF engine had been temporarily installed to provide a back-up service while a heavier-duty engine was awaiting repair. The new engine was rigged outside the engine shed, while the broken-down engine was still on the mountings inside. There was evidence of leakages at the top end of the borehole, and in the delivery pipe from the storage tank to the cattle watering trough. Drinking water was taken from a separate standpipe.
- A.21 The old engine, which the community group said they had installed themselves, had broken piston rings had been out of commission for more than a month. The 11 households sharing the water point were clearly having some difficulty in organising the repairs. After at first saying they had not taken the engine yet because they were still collecting money, they then said that they would not know how much money to collect until they had taken it for repair ! There was apparently some possibility that the provision of a standby engine may be acting as a disincentive for the group to get the old engine fixed.
- A.22 About two drums of diesel were required per month to run the engine, at a cost of R.270 per drum plus transport. Transport from Otuindjo is a significant extra as this is one of the farthest water points from Otjinene. Each household was paying an equal share to meet running costs, irrespective of stock holdings. The group acknowledged that this arrangement was causing problems among them, and this issue still had to be resolved. One of the group had been selected by the others to be the organiser for water point matters.
- A.23 The broken down engine had only been in service since last October, and had broken down already. According to the community, this was because of the almost continuous use required to deliver enough water from the 760 feet deep borehole. There was also a problem with the cylinder in the borehole which was affecting the rate of flow. The water point had been installed during the 1960's, and three engines had been used there so far (in addition to the current temporary one). The water point was supplying

between 1,200 and 2,000 livestock. Fuel was obtained from Otjinene, 110 kilometres away, while engine repairs were done at Gobabis, more than 300 kilometres away. Until 1988, running costs for the water point had been paid by the administration, but the community had been paying its own way since then. The group felt another borehole was required to provide the water required at Otuindjo. The community said that if a second borehole were provided, they would be able to run it from their own resources.

- A.24 Apart from the water shortage, the other major problem in the area was poison leaf, and the community asked if anything could be done about this.

Rietfontein Division

Obedsrus

- A.25 The community at Obedsrus appeared to be having the greatest water problems of all those visited on the field trip. When the mission arrived, there was barely any water in the storage tank and the flow rate from the borehole was very slow. The community group said that they were never able to get the tank more than about 25% full in any one day, and this was insufficient to water the 400 to 500 cattle and 12 households sharing the water point. At present, the water point is providing sufficient for half of the community's stock. The rest are taken to neighbouring farms for watering, in return for contributions of diesel.
- A.26 A UNICEF-supplied engine had been installed at the water point, supposedly as a temporary measure while the heavier duty engine already there was sent for repair. The engine was sitting on a temporary mounting. The local extension officer said efforts were being made to obtain some cement to make a firmer stand. The new engine, though of lesser capacity than the old, was pumping more efficiently, to the extent that the borehole was running dry after about 30 minutes or so and had to be left for the next two to three hours to recharge. The engine was stopped during the community meeting to allow the borehole to recharge. While the meeting was going on, a woman appeared from a nearby house and sat down with her bucket, ready to wait an hour or two for the water to start to flow again. The community felt strongly that they needed a second borehole.
- A.27 The group at Obedsrus said they were relatively poor in comparison with other farmers in the area, and were struggling to maintain the water point. Repair costs for the old engine had been very high, in addition to the day-to-day diesel requirements. Water was a problem throughout the Rietfontein Division, and other farmers would sometimes come to them for water, even though they did not have enough for themselves. This was an unsatisfactory situation which led to quarrels and disagreements. The need to go to other farms for water meant that not all members of the community were in the area at any one time and this made collecting money for fuel a problem. As well as having a very poor rate of flow from the borehole, leakages in the storage tank and at the top of the borehole meant that water was also being lost before it could be used.
- A.28 The water point had been established in 1974. At that time, the water flow was fine but had declined from about 1978 onwards. The borehole was 450 feet deep. Neighbouring farms were having similar problems. During the mission's visit it was frequently said that the Rietfontein area had the

biggest water problems in all of the Herero region.

Rietfontein Division

Ouwerf

- A.29 The community at Ouwerf were also experiencing problems with their water supply, though these were less severe than at Obedsrus because of the smaller group sharing the resource. A new UNICEF engine had just been installed at the water point, but was still on a temporary mounting. The engine shed had been dismantled and had not yet been rebuilt
- A.30 The storage tank at Ouwerf was only about half the average size, and reflected the relatively poor rate of flow from the borehole. The community had fitted a locking device on the tank outlet valve leading to the cattle watering trough in an attempt to regulate use of the supply. The group said that water flow was adequate for the 500 or so cattle that they had between their four households, but was stretched by frequent requests from neighbours to also use the water. This led to some problems. Other users were asked to bring diesel fuel with them when they wished to use the supply, but they did not always do so.
- A.31 The 860 feet deep borehole could not pump continuously, but had to be shut down after two to three hours and left to recharge for a similar length of time before being run again. The borehole yield was insufficient to fill the storage tank each day. The water point was established in 1980, replacing another nearby which had been abandoned. The previous engine had lasted for 10 years. Each of the four households using the water point was responsible for contributing a drum of diesel in turn, irrespective of their stock holdings. Contributions to the costs of repairs to the engine, on the other hand, were paid for in accordance with relative holdings. The group admitted that this arrangement caused some disagreements between them, with the less well off members being unhappy at making the same fuel contribution as the others. One drum of diesel usually lasted about two weeks, meaning that each household was expected to contribute a drum every eight weeks or so.
- A.32 A new farm had recently been opened nearby, with a water point, and this had helped to ease the burden on the supply at Ouwerf. Nevertheless, it was a constant struggle to get enough for both domestic and stock use. The water point is about 90 kilometres away from Talismanus, the divisional centre, where the nearest clinic and schools are to be found. The nearest fuel supply is about 30 kilometres away. The group said that oxen marketing kraals were needed closer by as they currently had to drive their cattle to Talismanus for sale. The cattle lost weight on the way and would not fetch such a good price.

Epukiro Division

Post #10

- A.33 Post #10 is close to the divisional centre at Epukiro, in a relatively high density area of settlement. About 20 households were sharing the water point, which had first been established in the 1920's, making it by

far the oldest water source seen during the mission. About 600 cattle were watering at the point each day, and perhaps another 200 small stock. The water supply is adequate for the community's own needs, but they were under constant pressure from neighbours whose supplies were not as good and this was creating some problems. The drive belt was removed whenever the engine was not running, to prevent theft, and the valves were locked off to prevent unauthorised use.

- A.34 Management of the water point is coordinated by the post foreman. Contributions for diesel and spares were made in accordance with relative stock holdings. The poorer farmers in the group sometimes found it difficult to make their contributions, particularly when large sums were needed to cope with major breakdowns. Casual users were asked to bring diesel fuel with them, but they did not always do so and this could lead to arguments. The group said that more boreholes were needed in the area, even though this would probably mean more expense for community members. Smaller users groups would make water points easier to manage, and there would be enough water for everybody. The group said they were hoping that more assistance would be forthcoming from the government to meet water point running costs and the provision of spare parts.
- A.35 The new engine had been installed on the 460 feet deep borehole, but the engine shed had not yet been rebuilt around it. The group said they felt that the new engine was not heavy duty enough for the borehole depth, and they had already had a breakdown even though the engine had only been installed a few weeks. The engine had overheated and the piston rings had burned out. The previous engine was a heavier duty water cooled Lister 3/1, while the new one was a lighter weight air cooled model. When the engine started, it took several minutes for the column of water to rise in the borehole. Although the community said the water flow was slow, it did not appear to be nearly as weak as that found in the Rietfontein Division. The group said they were able to fill their storage tank every day.
- A.36 The group suggested that the construction of earth storage dams in the area would help to ease the load on the boreholes, at least for part of the year. Roads in the area were also very poor, taking a heavy toll on vehicles.
- A.37 The meeting at Post #10 was attended by the Commissioner for Epukiro, a number of chiefs and headmen, and people from neighbouring water points. The chiefs requested that the mission return to Epukiro later in the day for a private meeting with community leaders. This was agreed.

Epukiro Division

Elandkop

- A.38 Elandkop was the last water point visited by the mission, and was also one of the remotest, being located in the Eiseb Block, close to the Botswana border. Water supplies were extremely hard to come by in this area, and the Dept. of Water Affairs had only been able to find six viable boreholes out of 24 attempts in this part of the region. The borehole at Elandkop was extremely productive, however, and provided sufficient supplies for three separate water points, several kilometres apart. A total of 21 households were making use of this water supply, with between 4,000 and

5,000 head of cattle watering at the three water points.

- A.39 A UNICEF engine had been brought to the water point, but was not in use at the time of the visit. A heavy duty engine was currently in operation, which had been borrowed from a neighbouring borehole while this was undergoing repairs. Water was pumped uphill to a large storage tank, from where it was run by gravity to two further tanks, one 3-4 kilometres away, and the other about five kilometres away. People from the post from where the engine had been borrowed were also currently using the supply. The engine is run twice a day for about two or three hours. The UNICEF engine had already broken down, due to overheating. The group said this was because it was not heavy duty enough to cope with the demand from the 290 feet borehole. As a result of the isolation of Elandskop, the community felt very vulnerable to breakdowns and requested that they be given a stand-by engine to cover in times of breakdown. The long distance between posts and the prevalence of poison leaf in the area made it difficult for them to move to other posts to get water. Extra boreholes would help the situation. In the past it has sometimes been necessary to provide Elandskop with tanker-delivered emergency water supplies. The provision of earth dams would help to provide extra back-up sources. There were some problems with the pipelines to the watering points, and these needed rehabilitation.
- A.40 The community members contribute to running costs and repairs, with each household paying an equal share irrespective of stock holdings. If people were missing at any time when collections were made, others would cover for them and the payments equalled out in the course of time. The community members at the meeting said everyone was reasonably happy with this arrangement and their were no serious problems. When water is provided for neighbouring posts, contributions of diesel fuel are requested.
- A.41 The nearest source of fuel is 90 kilometres away from Elandskop. Collections are made every time a drum of fuel is needed, meaning that a new drum has to be collected about every two weeks, and collections made just as often. They always manage to get the money, but never without difficulty. When asked why they did not buy larger stocks of fuel, the group said they were always short of money.
- A.42 The access road to Elandskop is in bad repair, and this adds to the community's sense of isolation. The nearest schools and clinic were in Epukiro, some 90 kilometres away. There were 70-80 children in the area and the community felt that a primary school was therefore justified. The community had been settled at Elandskop since 1983 on what they said had previously been White farm land.

Epukiro Division

Headmen's Meeting

- A.43 The headmen's meeting was held at the Commissioner's office in Epikuro. It was evident from the mood of the meeting that the headmen felt they had been by-passed by the mission, and they wished to have the opportunity to express their point of view. The headmen were not happy that the team had been going directly to water points. If the team wished to learn the

problems of the community, one said, we should hear from the leaders rather than the followers.

- A.44 The headmen pointed out that there were many problems in the area, as well as that of water, and were anxious to hear what help UNICEF was able to give. It was noted that this was an investigative mission and that no commitments could be made by the consultant on UNICEF's part. It was unlikely that UNICEF would be in a position to give any substantial help with regards to long-term recurrent costs, though modest capital inputs had already been made to help increase the self-reliance of the people. UNICEF was also providing general assistance to the government in many areas, not just in relation to water supply. The headmen said they appreciated the help that UNICEF had given, but felt that the engines provided were not heavy-duty enough for the depth of boreholes in the area. One headman asked if help could be given to owners of private boreholes, as well as to those whose boreholes had been provided by the state.
- A.45 The meeting was fairly brief, but helped to clarify a number of issues. It was evident that the headmen have high expectations that either the government, or an external support agency, could be persuaded to take over responsibility for the running and maintenance of water points, as had been the case in the past.