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Water in Transkei

Carl Keyter and Cecil Cook

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Introduction

In assessing the options for the supply of water to rural Transkei, the debate on how best to utilise the country's water sources has come to revolve around the question of whether small-scale labour-intensive projects or large-scale capital-intensive projects provide the best solution to the country's water consumption needs.

It is often the case that proponents of a particular approach, in their eagerness to promote it, will act as if all other approaches are inferior, whereas each carries both disadvantages and benefits. The purpose of this fact paper is to collate the debate in terms of the economic, technical, political, and organisational issues involved, and to test not only these widely divergent approaches, but also some to the intermediate alternatives which present themselves.

The debate remains as fluid as the subject it addresses. In a situation where priorities remain obscure, and the question of appropriateness still remains unanswered, the topic of water obviously needs further consideration. Hence, the secondary purpose of this paper is to keep the debate alive, in the hope that the eventual path to be followed will indeed lead to the provision in Transkei of the 'largest possible quantity of high quality water, at the smallest possible cost'.[1]

The problem

In Transkei, the problem of water is not the lack of it. Indeed, an evaluation of the country's natural and climatological resources points to an unrestricted abundance of it:

> *'Not only are the surface water resources of Transkei clearly very substantial, but the possibilities of water storage also appear (to be)*

promising... The ground water resource is very substantial and forms a very valuable resource, especially in rural areas'.[2]

If this optimistic assessment is at variance with the reality, it is because accessibility is not easy, and because the majority of Transkeians do not receive the minimal 20 litres needed per person per day for drinking, washing, and cooking. That water problems are the key ones for most rural areas, is borne out by a survey conducted in Umzimkulu, where 61% of households interviewed felt that their water needs were difficult to fulfill.[3]

The full scope of this difficulty is captured in the table below, which contains the water-related answers of respondents:

Table I: Water Needs - Problems and Strategies[4]

Type of water problem	Duration of Water Problem		
	Always a problem	Since resettlement	Total
Far away	30.8%	69.2%	26.9%
Inadequate	33.3%	66.7%	19.2%
Far and inadequate	42.5%	57.5%	21.2%
Total	41.0%	59.0%	n=156

The greatest problem identified was either that water was too far away (26.9%) or that it was inadequate in volume (19.2%). The fact that it was not considered unhealthy as well, was apparently at odds with the discovery that only one of the springs in the 14 residential areas surveyed was protected. The possible explanation is that insufficient volume is such a great problem that qualitative considerations tend to be overlooked.

A more pertinent consideration is that water problems can be seen to have increased since the closer resettlement of rural Transkeians under the government's 'Betterment-Planning' programme of yesteryear. This exacerbation of the rural water problem can be attributed to the fact that, at the time of the survey, planned water sources still had to be constructed, so that according to May, '...the result of Betterment-Planning has been to increase the concentration of population on existing water supplies.'[5]

This situation of population-overconcentration on a smaller number of water outlets is being exacerbated further by Transkei's poor windmill

maintenance record.

Thus, a survey in the south-west of the country discovered that, while excess water was generally good in villages with windmills, they were not working in one-third of the villages visited, and in one case, had been out of action for seven years.[6]

Furthermore, about 80% of springs, which were prime sources of water for villages, were found to be unprotected, and to suffer from livestock fouling.'[7]

On such evidence, it seems reasonable to generalise May's conclusion[8] that the majority of rural Transkeians do not have access to a convenient and adequate supply of water.

The logistics

In the light of such a massive deficiency, it is tempting to opt for the grand solution to Transkei's water problem. But what does this entail?

In analysing river flows in Transkei, Mdoda has pointed to the 'formidable and urgent tasks... regarding the supply and demand for all water and energy sources' which have emerged precisely because supplies do 'not conform favourably to the distribution of demand'.[9] For this reason, he envisages that 'increasing quantities of water will have to be conveyed over long distances'.[10] This possibility is also visualised on a wider Southern African scale by Stephenson[11] when he suggests that, if anticipated growth patterns materialise, it will become necessary, towards the middle of the 21st century, to import water to the Orange-Vaal basin from as far afield as the Okavango Swamps or the Indian Ocean.

In this context, the problem of Transkei's need for clean water for human consumption tends to be lost in a grand scenario which treats water essentially as a source of power and a tool for economic development of the wider sub-continent. Thus, the many waterfalls, rapids and meanders in Transkei are seen to offer possibilities for the generation of hydro-power because of the abundance of run-off water in the country's rivers. In specific terms, hydro-electric power is perceived as the one form of power generation that can become cheaper in a world bedeviled by escalating inflation.[12]

This line of thought has been dominating official policy for more than a decade now, ever since Paramount Chief K.D. Matanzima announced to the Transkeian Legislative Assembly in 1975 that Transkei's potential for hydro electric power generation was being investigated by the South African Department of Water Affairs. On that occasion, he pointed out that, since such a scheme would be far in excess of Transkei's

requirements, it would be feasible for the generated power to be exported to South Africa via the Escom grid.[13]

This approach of treating Transkei's water potential (like that of Lesotho's) as a servicing component of the wider South African economy, with little regard for the basic consumption needs of Transkeians, or indeed, for their development, has not gone unnoticed by those who advocate a scaled down version of the macroscopic scenario.

The reasoning behind this version is that, by scaling down the grand vision, it should be possible to widen the benefits to local actors. Thus, Mdoda proposes a procedure for estimating storage capacity/yield probability/serial correlation relationships in a way that can readily by applied and used by the processing engineer and hydrologist for designing a water storage system which can be utilised not merely for hydro power, but also for irrigation, industrial use, fish breeding and rural water supply.[14]

His answers, and identification of some of the limitations, should form part of any package designed for carrying out a cost-benefit analysis on a future water supply strategy for Transkei. His warning about the seriousness of attending to the country's future needs also should not be ignored, nor his cautionary note on the essentiality of careful planning,[15] since both help to focus on Transkeian, as distinct from wider South African needs.

An analysis of this focus is pursued in greater depth in the pages that follow.

The local challenge

Even in a scaled down scenario of the local Transkeian situation, the challenge of meeting water consumption needs alone remains daunting. The scope of the challenge has been captured by a national survey[16] which showed that about 50% of Transkei's *de facto* population had less than 10 litres a day in 1982. If the criterion is set at the 20 litres which is deemed to be the minimum requirement per person per day, then Transkei has the formidable task of supplying 2 650 villages, or 70% of the total population with water.

The challenge may be even greater than this proportion suggests, for the reason that the projection of number of villages to be covered is based on the assumption that the country's 1 200 windmills are fully operational, which they are not. In this regard, the 1982 records show that 40% of windmills, had, in fact, broken down, which meant that 480 villages were no longer being adequately serviced. Since 1982, however, about 90 more

windmill schemes have been erected, and a few regional water supply schemes have been constructed, or are being constructed.

Taking the latter efforts into consideration, and assuming that all of the 90 windmill schemes have been placed in critical areas, the approximate status as at September 1987 of the water supply position in the villages is that 47% of villages are in a 'critical' condition, while a further 39% can be classified as 'needy'.[17]

Stated succinctly, 86% of villages in Transkei, comprising 88% of the population, suffer from an inadequate supply of water.

Approaches to the challenge

It is precisely because the dimensions of the challenge are so massive that protagonists of various solutions have been led to adopt widely divergent approaches.

On the one hand, the argument favouring large scale schemes rests on the premise that any homeland, such as Transkei, cannot hope to solve its water consumption problem on its own, in isolation from other homelands.

On the other hand, the argument favouring small-scale water schemes rests mainly on what the country and its people can afford at this stage of its development.

In between, lie various arguments which favour a hybrid arrangement between low and high technology, and others which stress the importance of a technology which is both affordable and maintainable.

These arguments can be set out as five basic options open to Transkei.

Option One
A joint RSA - TBVC international scheme

The argument in favour of the large-scale option, as forwarded by the South African Department of Water Affairs, advocates the joint use of water by the RSA and the TBVC states on the strength of a number of interrelated considerations. It is maintained that, in many parts of South Africa, fragmented water development is impractical; that effective collaboration is required to achieve the optimal allocation of water resources serving different countries; that the choice of suitable dam sites to develop the water resources of a particular river is a complicated exercise; and that many interdependent factors have to be taken into account to arrive at the most economic and appropriate solution.

The whole approach is to avoid dissipation of effort on a wide front, by opting instead for the economies of scale which are summed in the

following conclusion:

> *'Dams should be built where nature dictates, regardless of political boundaries. The economic advantages of scale decree that it is generally cheaper to build a single dam, rather than separate ones, each supplying part of a demand.*[18]

Such an approach, which starts off by favouring large-scale over small-scale projects for meeting the local Transkeian water consumption needs, inevitably drifts into the grand scenario which, as enunciated earlier, renders local needs subservient to macro needs:

> *'Excess water from the Umzimvubu River could also be piped to the upper reaches of the Orange River, from where it could be delivered to the PWV area via the proposed Lesotho Highlands project; or water from the Transkei could be diverted westward towards the Border area'.*[19]

There are no pointers here or elsewhere how the scheme would meet the specific water consumption needs of rural Transkeians, nor of the capital and maintenance costs that would be involved. Until such time as a definite cost-and-benefit sharing arrangement is negotiated, the scheme must remain remote from the daily struggle for water which marks the existence of the majority of rural inhabitants.

Option Two
A 'High-technology' National Scheme

In support of a more focussed effort, there are those in the Transkeian government who argue in favour of a national water scheme for the country on the grounds that the government of South Africa owes the people of Transkei enough funds, even if only in the form of loan capital, to pay for the installation of a high-technology water supply to every rural homesite.

One factor which inhibits this solution to Transkei's water consumption needs is undoubtedly the prohibitive costs, irrespective of which party carries them - whether Transkei or RSA, or both jointly. For even if South Africa were to carry the main capital burden (which is open to extreme doubt) it is certain that Transkei would still be saddled with the responsibility of expensive maintenance.

It has been estimated, for instance, that a large scale national water scheme for Transkei would require a capital investment of somewhere between R2.6 billion and R3.5 billion, costing between R750 and R1 000 per capita.

In addition to this capital investment, however, the operating costs of such a national scheme would run at between R100m and R150m annually, which is more than twice the entire budget of the Transkei Department of Agriculture and Forestry; while the cost of borrowing and paying back some R3 billion at 6% interest over 20 years (assuming the more likely loan capital option) would add another R250m. This means that the cost of providing Transkeians with a tap in every home would be in the order of R350m to R400m annually, or about 25% of the present annual budget of the Transkei government.[20]

In measuring these costs against the country's low level of incomes, it is pertinent to ask whether at this stage of the country's development, the majority of Transkeians could afford the convenience of a high-technology water supply system? With an average annual income of R354 per capita for the country as a whole (including urban wages), the average Transkeian's water bill would absorb 28% of his income; and if the civil service wage element were to be excluded from per capita income, the cost for the average rural household head would be even higher, or close to 40% of his total income.

The issue of affordability, therefore, tends to rule out the possibility of bringing on-site tap water to the majority of Transkeians.

Option 3
An Integrated 'high-technology' scheme

With a keener eye on what is affordable, a major study by a firm of consultants[21] has put forward a water supply option which slashes the capital cost by a third to R250-R300 per capita, and the annual payback and operating costs from R100 to a range of R10 to R20 per user, comprising 2.8% to 5.6% of average per capita income. With it, the annual cost per family decreases from R500 to about R80.

Commissioned by the Department of Agriculture and Forestry, the study is being used as the basis for launching an integrated water scheme comprising 10 large reticulated rural water supply systems that attempt to serve both district towns, as well as a network of rural communities, and in some cases irrigation components.

Even as a start has been made to the scheme, an uneasy suspicion has emerged that the 10-dam scheme will fall short of meeting the country's total water consumption needs. It is now thought that the 10 proposed dams devised for a total capital cost of R300m to R400m, would be capable of reaching less than 40% of the population. Even then, the supply to a minority of the population would not be direct, but would reach rural

localities through strategically-placed small control reservoirs aimed at providing 50 litres per person per day to within 200m of the homesite.

In the latter regard, the funding body of the scheme, the Development Bank of Southern Africa (DBSA), has managed to convince the implementing body, the Department of Agriculture and Forestry's Engineering Branch, that it makes sense to create the final link-up from village to small control reservoir by including a 'self-help' component in the programme. It has been agreed that, as water is brought to these small reservoir points from the main pipelines laid down by the contractors, villagers would need to organise committees, collect monies for materials, and mobilise labour to connect their villages up to their nearest control reservoirs.

There is disagreement, however, over the question of user fees. The implementor of this option, the Department of Agriculture and Forestry, feels that rural villagers which create the link-up at their own expense, should not have to pay any user fees for this water. But the DBSA has insisted that user fees must be paid so as to generate some revenues for repaying loans.

The disagreement over user fees highlights some of the complications likely to arise out of this hybrid arrangement. One obvious one would be the reluctance of rural communities to carry the costs of a link-up, only to have to pay the government for water that they previously were getting from their immediate environment for free. Another complication would be the difficulty of collecting user fees for servicing the loans of R300m to R400m needed to implement the schemes, and to cover a reasonable percentage of the running costs.

In the final analysis, the big question mark hanging over these large integrated water schemes is whether the Department of Agriculture and Forestry's Engineering Branch could keep them operational, and do so on a cost recovery basis.

Option four
Affordable schemes

Given the distinct possibility that the majority of Transkeians, who are the rural poor, would be unable to carry the consumer rates of a large-scale scheme, or would be reluctant to link themselves up as paying consumers to a hybrid scheme, on further option needs to be explored: to plan according to what rural peoples can afford.

There are two variants to this option, namely: a 'no-tech' intervention and an 'intermediate high-tech' intervention. They represent two

extremes of rural affordability which, for different reasons, have not proved successful.

i) The 'no-tech' intervention

It has been the experience of the Department of Agriculture and Forestry that, where the 'no-tech' variant has been implemented, by fencing in major springs to keep animals from contaminating the water, these fences have not been maintained by the community.

One reason for this omission is that the mere fencing off of springs falls short of guaranteeing a clean water supply under circumstances where surface spring water becomes easily contaminated by run-off water during heavy rain storms.

ii) The 'intermediate 'high-tech' variant

This variant, which involves the installation of windmills, has likewise proven unsuccessful.

The Department of Agriculture and Forestry's Engineering Branch has experienced difficulties in maintaining the thousand plus windmill-powered water systems in Transkei, as revealed by the fact that at least 40% of windmills, and in some areas as many as 70%, have broken down.[22]

While the use of windmills to provide clean water for domestic consumption is a proven and reliable technology, it seems that the maintenance of a combined borehole/windmill/reservoir/simple reticulation system lies beyond the community's technical competence and the government's administrative capacity.

Option five
An intermediate 'low-tech' community initiative approach

Since the missing elements in all the above options is consultation with the recipients, the final option remaining is one which is not only affordable and acceptable to rural communities, but also involves the latter's participation, so that they can own the scheme and in owning it, come to maintain it.

This final option involves an 'intermediate low-tech' approach which seeks to upgrade all existing perennial springs and sources of surface water available to the total rural population of some 3 million, at a capital cost of between R30m and R90m, or a capital cost per consumer of R10 to R30.

Under this scheme, it is proposed that the government, or outside

funder, enter into a partnership arrangement with each community, whereby the community would be expected to contribute a quarter of the costs, and the government/outside funder three-quarters.

The capital costs involved in such an approach fall within the country's means, provided that the investment is spread out over a decade. On the basis that there are some 5 000 rural villages in Transkei, it can be assumed that there are 4 000 communities in need of assistance in radically upgrading their water sources into improved rural water schemes. Taking an average of 500 people per community, the sharing of costs can be estimated as follows:

a)	**Government/outside funding source**	
	500 person village at R15/person x 4 000 =	R30m
b)	**Local community cash contribution**	
	150 tax payers at R10/tax payer x 4 000 =	R 6m
c)	**Local community labour contribution**	
	200 person days at R5/day x 4 000 =	R 4m
	Total =	R40m

Thus, it would take a capital injection by government/outside funding source of R3m per annum at constant 1989 rands over the next 10 years to secure the water consumption needs of the majority of Transkeians who presently depend entirely on unimproved water sources.[23]

The above approach, which has come to be known as the 'Rural Water Initiative Programme' (RWIP), is the answer of the Transkei Appropriate Technology Unit (TATU) to the water debate. Its feasibility has been demonstrated by TATU's ex-managing director, Cecil Cook, through 75 village water projects implemented in partnership with villagers during 1983-1986.

Operating by force of gravity from small springs and perennial streams, these TATU-initiated water schemes involve protection of the water source from contamination by means of fencing and spring protection boxes; purification of the water source by installation of a simple sand-filter system; the piping of water to a 4 000 to 12 000 litre capacity ferro-cement reservoir geared to the size of flow needed by the community; and the installation of anything from one to six stand pipes with taps.

On the costings front, materials for such a typical scheme would represent about a third of the project's total cost; the community would be

required to pay a reasonable percentage of these material costs, divided equally among all tax payers, and would also be asked to contribute labour. The costing details of the scheme would read roughly as follows:

* The village has a thousand people, including 250 tax payers, and the local water committee agrees to the payment of R8 per taxpayer totalling R2 000, as a cash contribution towards raw materials comprising six stand pipes, 500 metres of 30mm pipe; 300 metres of 25mm pipe, a 12 000 litre ferro-cement reservoir, and protection boxes.
* The labour required from the community is about 200 person days (one day per family), worth in total R1 200 (ie. 200 days x R6 a day).
* Outside intervention in "the scheme comes in the form of professional design, worth R1 OOO; community organising by outreach workers, worth R2 500; technical supervision and training of a village technician worth R1 OOO; and administrative overheads of some R500.
* The total capital of tile scheme is thus just over R8 0OO,or about R8 per user.

The question might well be asked :

What are the logistics involved in ensuring that every village in Transkei has an adequate supply of clean water within the envisaged 10-year time-span? The completion of the 4,000 community water systems for those needing assistance will need 6 to 8 motorized rural water technology teams (of up to 2 to 3 persons each) in the field for the first 12 months; 18 to 20 teams by the end of the second year; 28 teams by the end of the third year (or one team per district completing roughly 20 systems per month).

Other methods, such as the training up of private contractors , or the handing of construction to Tribal Water Authorities (TWA's) should make, it possible to approach a rate of 500 community water systems completed in the fourth and fifth years, so that the total average rate, of 400 a year should see all 4 000 systems in place within the 10-year time frame.[24]

This community-initiative approach obviously does not provide the complete answer to Transkei's water consumption problems. One disadvantage, of the scheme is that is makes no attempt to overcome a scarcity of water which, as pointed out earlier in this paper[25] has been artificially created by closer resettlement under the 'Betterment-Planning'

programme. The approach is only appropriate where there is already an available source of water capable of yielding 20 litres per consumer daily. While there are many springs in overpopulated villages which are unable to produce this amount, there are a surprising number of sources serving at least half of Transkeian villages, which do indeed have the potential for yielding the required minimum capacity, although this fact would need to be verified by proper scientific quantification of these sources prior to upgrading.[26]

Another disadvantage of the community-initiative approach is that the work cannot be left entirely to communities, but requires substantial organizational and careful financial input by the government or outside funder. For without such involvement, and the provision of appropriate engineering know-how, the approach cannot be sustained. However, since this is even more true of the other options, which would require not only higher capital investments but also full governmental involvement in their implementation, operations and maintenance, the disadvantages of the small water initiative approach tend to be outweighed by some distinct advantages.

One obvious advantage is that is that it relieves the government of the onus of operating and maintaining these small water schemes. These in any case involve minimal maintenance costs which can be covered easily by a water tax of R1, or less, per user per annum.

Another advantage is that the programme builds up the capacities of rural communities for local self-management.

Assessment of Options

The choice of the most feasible option for ensuring an adequate supply of clean water for the majority of Transkeians rests not only on economic and technical considerations, but political and organisational ones as well.

Politically, it is a sensitive point that, while all South African whites have water in their homes, only a minority of blacks - whether rural or urban - have similar benefits.

In Transkei where the majority of rural dwellers compete with pigs and cattle to obtain their drinking water, there is a strong presumption that the South African government ought to make available sufficient funds to pay for the installation of water taps, if not inside each house or on each residential stand, then at least close enough to every homesite.

Three problems, however, stand in the way.

The first problem is that the introduction of a tap-water system to all

Transkeian villages involving hybrid 'high-tech' Option Three, would be at least 50 times more costly to construct, and at least 50 times more costly to operate than 'the intermediate low-tech' Option Five. Under these circumstances, capital emerges as the major constraint. Transkei would be fortunate if it were to secure R25m to R3Om a year over the next 10 years for the construction of water schemes; and even if it did, such capital would probably only be adequate for supplying 30%, or at the most, 40% of the population with tapped water.[27]

The second problem relates to the maintenance costs involved in a 'high-tech' approach (whether complex or intermediate) to solving the rural water problem.

As in the case of the poor maintenance record for Transkeian, windmills, follow-up studies on rural water supply systems in Africa by the Danish, Swedish, and Norwegian governments have indicated that, after 10 years, less than 20% of the systems financed by foreign assistance programmes were still operational.

A third problem lies with the acceptability of these schemes by rural communities under circumstances where they would be expected to pay costly user fees for inappropriate services established without their consultation.

Any programme designed for overcoming these problems, therefore, would need to encompass, as a first and necessary step, proper consultation with the prospective rural consumer, to find out what is appropriate and affordable.

An appropriate scheme which is also affordable is the rural water initiative scheme outlined under Option Five, which has the added advantage of resting on a sense of political obligation towards the majority of Transkeians.

In deciding what constitutes both an economically feasible and politically acceptable standard of rural water schemes, it is prudent to consider the following rhetorical question: is it wiser to spend R6Om to provide 1% of the population with a 90% improvement in their water supply (as implied under Option Three), or to spend the same money to provide 90% of the people with a 10% improvement in water supply under option Five?

In terms of mass political appeal, the latter wins, while the former can only contribute to growing disaffection among the majority.

However, a programme aimed at a 10% upliftment for 90% of the people clearly requires a radical shift both in the government's political thinking and in its organizational approach.

The shift in organizational thinking would need to be a three-tiered one, occurring at the community, regional, and central government levels.

The Community

At the community level, the active participation of the people will need to be enlisted along the lines adopted by TATU's Rural Initiative Water Programme (RIWP) introduced from 1983 to 1987 in the Mt Frere and Cala districts. This involves the community forming a village water committee at a public meeting; village taxpayers contributing towards raw material costs; an outside engineer laying out the system after full consultation with the community; the community agreeing to labour responsibilities for each task in the project process; the training of a suitable villager to serve as community water technician; construction of the system under outside supervision; and the handing over of the completed water system to the committee for maintaining the scheme through subsequent small water and/or labour taxes.[28]

The Region

Organization at the regional level calls for the representation of separate village water committees on a Tribal Water Authority (TWA) that is recognized by the chief and magistrate, so that a standing local water tax of R4 per annum, or more, can be gazetted in order to maintain and extend the community water works under the TWA's jurisdiction.

To cover the whole of rural Transkei, it would be necessary to form 180 TWAs. Once these TWAs are operating, the Rural Water Initiative Programme could match their tax revenues on a 1:2 or 1:3 basis. As these TWAs expand their work, the water-supplying burden of the Department of Agriculture and Forestry's Engineering Branch would be reduced as the management and maintenance of rural water systems gradually comes to be transferred to a representative people's body which is functionally geared towards meeting the water needs of the rural majority. An incidental benefit of this would be the beginnings of effective local government which runs parallel to traditional forms of government.[29]

The Government

At the central level, the question arises as to the most effective. way of implementing a rural water initiative programme nationally? In an attempt to provide an answer, the Ad Hoc Rural Water Supply Assessment committee, appointed by the Military government in May 1989, has seen

fit to make a distinction between planning and implementation.

For the planning function, the Committee supported the idea of establishing a national Water Authority, but urged that such an authority should incorporate a Community Participation Division with a view to ensuring the representativeness of parties involved in the planning processes, notably by calling on relevant organizations who have been involved in self-help rural water supply.[30]

With regard to implementation the same Committee felt that the government should not only recognize the role of non-government organisations which operate in the field of community development, but should show its willingness to welcome non-government organizations (NGOs) able to carry out community water supply schemes in Transkei. It advised that such willingness be demonstrated by: the government exercising minimal control; increasing its readiness to delegate and contract out, certain types of water projects to competent NGOs; and the government itself possibly expanding on the visible successes of NGOs. To the latter end, it was felt that government should encourage NGOs to liaise with relevant departments and others in Transkei, so that knowledge can be shared, and facilitation and implementation skills can be transmitted through government-organized training.[31]

Two considerations have influenced the committee's thinking. The first revolves around the question of funds, and how best to secure these; and the second around the question of expertise.

On the issue of funding a national rural water initiative programme, it is pertinent to note that, on the government's side, funds already allocated by the Development Bank of Southern Africa (DBSA) for water development (notably to the Department of Agriculture and Forestry's Engineering Branch for the 10 'high-tech' supply schemes of Option Three) are already tied up by specific project funding procedures, and thus, cannot be hived off to finance water projects which do not conform to the project description. Therefore, funds which are specifically geared to a community small water initiative programme would need to be sought from the large private sector in South Africa.

Such private sector funds are more easily secured by a non-government organizations, since the large corporate donors (Mobil, BP, JCI, Barlow-Rand etc), as a matter of policy, tend not to commit funds to government-controlled organisations.

There is the added consideration here, that Transkei is receiving less than its fair share of these corporate monies, so that for instance, Transkei (with 10% of the population of South Africa) has been receiving less than

R5m a year of the R300m to R400m expended by corporate social responsibility programmes, whereas it should be receiving R30m to R40m.

Under these circumstances it has been suggested that there is a strong case for forming a 'special purpose NGO' - under the title of the 'Transkei Rural Water Initiative Trust' - which would seek to attract a larger share of charitable funds.[32]

The final consideration is that of expertise. Since NGOs, with their emphasis on community development, are already geared towards the type of programmes involving community participation, it makes sense for them to carry the main thrust of a small water initiative programme under the wing of the RIW Trust.

But if the programme is to proceed without any funding hiccups, the DBSA would need to be drawn into a cost-sharing agreement. Given the DBSA's willingness to consider the direct funding of NGOs, the pattern of financing which should prove to be most viable would be one where corporate donations make up 35% of the programme costs, the DBSA 40% by way of grants, and the community 25% by way of cash and labour.

Conclusion

Of the four options open to Transkei for meeting its water consumption needs, the community small water initiative approach emerges as the most apt at the current stage of the country's development.

The approach obviously does not provide the complete answer to Transkei's water consumption needs. The upgrading of small rural water schemes should be viewed rather, as a form of transitional technology that will gradually be replaced by higher performance village systems, as and when the Transkeian or regional economy develops the tax revenues and surpluses needed to finance the much larger schemes.

But as the means of reaching the largest possible number at the lowest possible cost, the approach needs to be given the priority which so far has been lacking in government's water policy.

In the final analysis, any shift in that policy calls for a delicate reshuffling of the politico-economic scenery in order to accommodate a partnership and cost-sharing arrangement.

Only such an arrangement, between a wisely-informed government and appropriately-skilled private actors, can provide the platform for successful implementation.

October 1989

Footnotes

1 Vandeverre Apsey Robinson and Associates (VARA) Report to the Development Secretariat Office of the Military Council , September 1988, p9.

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22 VARA, op cit p3, In 1983, a random spot check of windmills along the national roads showed that approximately 70% were non-functional.

23 VARA, op cit, pp 111-12

24 VARA, op cit, p16

25 cf p4 of this paper.

26 Evidence submitted by Stephen Wuliminga, Head of Technical Services, TATU, to the Ad Hoc Rural Development Water Committee, 3/4/89

27 VARA, op cit p4. The consultants concluded that : "The 10 schemes designed by the consulting engineers [would] reach less than 40% of the population of Transkei".

28 VARA, op cit, p12.

29 VARA, op cit, p13.

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Appendix I: Options Summarised

	Capital cost per user	Estimated cost to supply 3 million rural users	Annual maintenance and operating cost per user and total cost	Maintenance responsibility
Minimal 'no-tech' water supply system	R1-R2	R6 000 000	Per User - 10c Total - R300 000	Local Admin. area water committee
Intermediate 'low-tech' rural water supply system	R10-R30	R30 000 000 to R90 000 000	For user - R1 Total - R3 000 000	Local tribal Authority Water Committees

Disadvantages	Advantages	Brief descriptions of technological content of different approaches to rural water supply
Water may get contaminated; necessary to walk; self-help labour requirement; must form standing water committee in village; fence often not maintained	Can easily be implemented within governmental budgets and existing expertise; puts burden of upliftment on rural communities	Typically consisted of fencing a spring site where the people obtain their drinking water. A gate or large animal proof entry was provided. Sometimes diversion ditches were dug to protect the spring from run off contamination. The principal benefit of this approach is to prevent animals from dirtying the spring water; the water is still likely to be contaminated with bacteria. The fences are worn down by animals and the gates fall into disrepair after a few years.
May still be necessary to walk; local community must form a standing water committee and tax each head of household; self help labour requirements; less appropriate where surface water is scarce and inappropriate where there is no surface water. Water supply may diminish during dry season or during drought years	Without substantial cost sharing by government and the provision of scarce engineering know-how, this approach cannot be sustained. Can be implemented nationally within 5-10 years. Builds up capacity of rural communities for local self management. Minimal maintenance costs and user fees (or water tax) of R1 per user. Community bears up to 25% of total project cost (advantage to government)	Typically involves sealing the eye of the spring with a concrete cover over a small collection basin (with and overflow pipe), piping water to a 4 000 to 12 000 litre ferro-cement tank, and then piping to one or more conveniently positioned stand pipes. Other low tech approaches include diversion wiers on small streams from which raw water is piped to slow sand filters and F/C storage reservoirs siphoning water from stock ponds into slow sand filters and then into F/C reservoirs, ram pumping water up hill from a fast flowing stream into a holding reservoir and then gravitating raw water through sand filters into storage reservoirs, hand dug wells (4-6 meters) sunk into the aquafers along slow flowing streams that are sealed with a concrete cap and supplied with hand pumps

Appendix I: continued

	Capital cost per user	Estimated cost to supply 3 million rural users	Annual maintenance and operating cost per user and total cost	Maintenance responsibility
Intermediate 'high-tech' rural water supply system	R50 to R100	R150 000 000 to R300 000 000	Per user: R5 Total: R15 000 000	Dept of A&F Engineering Branch
Complete 'high-tech' water supply	R450 to R650	R1450000000 to R2050000000	Per user: R50 Total: R150 000 000 to R225 000 000	Dept A & F Engineering Branch

Disadvantages	Advantages	Brief descriptions of technological content of different approaches to rural water supply
Dependent upon departmental maintenance; subject to periodic breakdown; people still walk to the closest source of surface water, regardless of contamination	Appropriate where surface water is scarce and ground water is accessible. Provides potable water of good quality unless ground water is brackish.	The drilling of a deep well which is outfitted with a wind powered force head pump to push water up hill to a large reservoir (50 000 litres). The water is then reticulated to stand pipes throughout the village. The higher the surface of the ground to the storage reservoir, the greater the technological stress on the hardware and the more frequent the breakdowns. Rural water systems using windmills pumping to high heads require constant maintenance. The windmill pump can supply a nearby reservoir or the well can be fitted with a hand powered pump.
Dependence on costly engineering expertise. Potential for large breakdowns. Capital constrain may delay construction for more than 25 years. Households must pay for water formerly obtained for free from environment. Govt. must bear interest and principal payments of R100 to R150 million a year for 20 years or more. The invillage component of scheme is partially self-help, therefore the scheme is complex and subject to malfunction at more than one level	Appropriate where surface water and ground water are both scarce; also, where large investments in dams have already been made; also where population densities are to high to supply cost effectively from local water sources. A certain percentage of the monies spent on the labour use in the 'labour-based' construction of the scheme will benefit those families with members who get a chance to work	The integrated regional rural water supply schemes typically involve large dams, major water purification works, pumping stations, large water transport mains carrying raw and purified water over long distances, secondary and tertiary water storage reservoirs, in-village reticulation and stand pipes. These systems are designed with sufficient surplus capacity to provide 50 litres per day per user and to accommodate 20 years of population growth. Between 100 and 200 villages, a district town and small irrigation schemes may be linked together in one regional water scheme. These schemes require constant monitoring and maintenance by experts and technicians to keep them fully operational. A breakdown in any major component can interrupt water supply to thousands of 'customers'.

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