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An alternative approach - small-scale improvements to existing sources
1. RURAL WATER SUPPLIES IN TANZANIA
1.1. The target

In 1971 a 20 year programme for the rural water supply sector was prepared, with the target to supply adequate water (piped supplies) to all Tanzanians by 1991. However following the villagisation programme in the early 70s, the government was compelled to accelerate the improved water supply programme. Thus a second objective was formulated in 1975 as the provision of each village with at least one adequate source of water by 1981.

1.2. The progress

Given the magnitude of the task and the limited resources available, it is not surprising that the 1981 objective has not been attained, and that achievement of the 1991 goal does not seem probable. It is very difficult to assess just what has been achieved in the rural water supply sector in Tanzania to date. Government figures (1983) state that 39% of the rural population have access to safe water.¹ However there are all indications that this figure is far too high, as it is necessary to distinguish between potential capacity of the schemes constructed and the actual service provided. Many schemes constructed are not functioning to capacity or not at all. In addition, even when schemes are functioning the intended consumers may not utilize them. The aspect of utilization is crucial as the non-utilization of operational schemes lowers the percent of population actually benefiting from improved supplies even further. There has been no reliable assessment of the actual impact of the improvements to date. However it is believed to be slight since the percent of the population actually benefiting from improved water supply may be as low as 5% in many regions, which ironically is the same figure given for early post-independence.

1.3. The problems and proposed solutions

The poor performance in the rural water supply sector can be attributed to

- a) inappropriate technology choice
- b) neglect of operation/maintenance and rehabilitation aspects
- c) lack of community participation

The failures in these areas have been recog-

recognized by government and outside donors and some steps have been taken to rectify the problems. Thus the ILO study (1982)² commends "*recent Governmental changes in orientation*" which were a growing emphasis on rehabilitation and operation/maintenance, and a move towards a simpler technology.

The technology type which has been emphasised in Tanzania in recent years is shallow wells with hand or foot pumps. The move towards this technology type is usually motivated by the financial gains, i.e. that the per capita development cost is 80 Tanzanian shillings as opposed to 250 for diesel powered surface supplies.³ In addition there is an increasing belief that, theoretically at least, the simpler the technology the greater the potential for community involvement and the less complicated the operation/maintenance infrastructure required.

The shallow wells with handpumps technology has been implemented on a relatively wide scale in Tanzania. However it would appear that the actual impact of this strategy has been very slight. The most appropriate level of technology has not been reached - i.e. a level which will allow for maximum attainment of impact.

2. LIMITATIONS OF THE SHALLOW WELLS WITH HANDPUMPS STRATEGY
2.1. Inadequate density of supply points

If any benefits are to be attained from a shallow wells with handpumps programme, there must be a sufficient number of supply points in each village. The normal criteria for Tanzania is to estimate one well for 250 people. However the political and economic realities influence the actual performance in implementation. A serious constraint can be identified in the goal to reach all villages with at least some form of improved supply. The scarce financial resources must, for political reasons, be equally divided between districts, wards and villages. As a result there is usually a very low density of supply points in individual villages. Very few villages, if any, receive adequate coverage and the impact can thus often be said to be non-existent.⁴ It is simply not economically feasible to envisage constructing the number of wells which would

be necessary in each village to give the density essential for any real impact.

2.2. Inadequate accessibility

Far too often the shallow wells with hand pumps which are installed in the villages cannot compete with the traditional sources with regard to accessibility. This obviously has implications for the actual utilization of the wells, which is in turn related to the level of impact. Good accessibility is a crucial factor for both increased convenience and the attainment of health benefits. There is increasing evidence that the most important criteria for the women water-carriers is, for very practical reasons, improved accessibility. Unless an improved supply is definitely closer than all other alternative sources in all seasons, experience from Shinyanga region shows that the households will continue to use the traditional sources, at least in the rainy season.⁵ Similarly it was revealed in Singida region that households using the improved supplies did not always completely abandon the traditional sources.⁶ Obviously the non-abandonment of unimproved, polluted sources negates the health benefits of the improved supplies.

2.3. Problems of reliability

With regard to reliability, handpumps are certainly better than pumped supplies which rely on supplies of diesel. However breakdowns of handpumps are common, and maintenance is far from adequate. If hundreds of hand pumps are dispersed over a whole region, the problems of maintenance become enormous for a central organization. To date the maintenance infrastructure has proven inadequate, as evidenced by the long delays experienced in Shinyanga and Singida regions to get handpumps repaired.⁷ The solution often proposed - to hand over responsibility for maintenance to the village - is not in itself a simple solution. Even given adequate training inputs, the problems of spare parts for so many wells is daunting.

2.4. What conclusions can be drawn?

The results of surveys in Shinyanga and Singida regions showed the impact of the shallow wells with handpumps programme to be negligible.⁸ Those actually using the improved sources were only a small percentage of the total population, since so few improved supplies had been constructed. In addition, the problems of breakdowns negated the benefits to these few households. The limited impact must be related to the problems of reliability and accessibility (i.e. density and location of supply points) In order to achieve the expected benefits of improved health and increased convenience, the improved

supplies must be able to compete with the traditional sources in terms of both these factors. Nowhere have these conditions been met and it seems unlikely that there can be any improvement in the immediate future, given the constraints operating at present, in particular the economic realities. What is needed is an alternative strategy which can guarantee accessibility and reliability, optimum operation and utilization, and optimum impact.

3. AN ALTERNATIVE PROPOSED: IMPROVEMENT OF TRADITIONAL SOURCES

Given the economic situation and political goals on one hand, and the necessity to improve the water supplies for all members of the community on the other, it would appear that a more appropriate strategy would be the improvement of existing traditional sources. The starting point for such improvements would be an inventory of traditional sources already in use. Implementation would be concerned with establishing how many of these can be improved to give water supplies of better quality, quantity and reliability. Improvements could be of many different types - deepening and lining wells, installing aprons, and where absolutely necessary installing hand or foot pumps.

Each community has developed a traditional user-choice system which is adapted to the physical, social and economic context in which it exists. Any improvement of water supplies should therefore begin with an investigation of the system already functioning. An improved system should be based on an understanding of water-use, water organization and water values and thus an understanding of the environment, its uses and the users' perceptions is an essential starting point.

3.1. Motivation for such a strategy

Experiences in Singida region on the acceptance of change in rural communities seemed to indicate certain essential criteria for the diffusion of innovations:⁹

- the innovation should not upset the existing traditional structures too much
- it must involve advantages for the communities (as understood by themselves)
- it should not involve too many costs in terms of money, time or energy
- it should be comprehensible to the community
- efforts should be directed in particular to the homestead/household level

The strategy of improving traditional sources would appear to be in keeping with these criteria. Other reasons which indicate it would be a realistic and appropriate strategy

are discussed below.

a) Only way to achieve impact

The improvement of traditional sources guarantees that accessibility will not be worsened, while quality, quantity and reliability can be improved by varying degrees. There is a greater chance that the improvements will be accepted and that benefits will be achieved.

b) In keeping with traditional practices

By building on something already existing, and making small, comprehensible changes, there is more likelihood of the acceptance of the improvement and its success. Many traditional water-use systems are multi-source, in response to no single source being adequate to all needs. It would therefore appear advantageous to consider improving the water supply from all sources rather than planning to construct one completely new supply.

c) A least-cost technology

This strategy is in keeping with the economic realities since the economic requirements are relatively modest. Sources can be improved by quite simple means and local materials and know-how utilized to a greater extent than at present. A complicated and expensive maintenance infrastructure would not be necessary and the present problems of spare parts could be lessened.

d) Facilitates community involvement - especially of women

Such a strategy involving a minimum of resources and limited input from outside lends itself to community participation and the "user-choice" approach. The problems of trying to make the women accept and identify with the improved supplies are not relevant since their links with the sources are already well established. Thus their participation in planning, implementation, operation/maintenance and evaluation can be facilitated. In this respect the reduced capacity for high-level technology may prove positive for women in terms of increasing their involvement in community affairs. 10.

e) Possibility to improve sources for non-domestic uses

An advantage, likely to be appreciated by many rural communities, is the possibility to improve those sources which are rejected for domestic use, for non-domestic purposes such as watering livestock or irrigating small vegetable gardens.

f) Facilitates diffusion to other communities

The chances of meeting felt needs and achieving benefits are enhanced. Impact could be achieved at a faster rate since delays in implementation could be shortened. Success in one village could encourage other villages to seek assistance - the elusive "felt need". Diffusion would be facilitated if women are actively involved.

3.2. How realistic a proposal?

Such a strategy would doubtless meet with much hesitancy and opposition initially - from both planners/administrators and the consumers. There has already been a lowering of expectations from piped supplies to wells with handpumps, and now it is suggested that there should be a further lowering of technical standards to improvements to traditional sources. It requires a basic change in attitudes at all levels. It is nevertheless considered the only feasible strategy for Tanzania at this point in time - the only way a reasonable level of service can be provided and maintained. However, before it can succeed a lot of attention has to be given to aspects of practical implementation.

3.3. Practical implementation of the strategy

The starting point should be to assess the suitability of the source from the point of view of accessibility for domestic uses. If ease of access is acceptable, the next consideration is chemical standards of water quality. If the water quality is chemically suitable the reliability of the source is investigated. Given adequate yield the bacteriological standards are assessed. If the source meets all these criteria it can be considered for water for domestic uses.

If the source fails to meet the conditions for acceptable accessibility or chemical standards and is thus ruled out for domestic purposes, it can be considered for non-domestic uses, such as watering livestock. Where reliability is a problem it may be possible to improve it for domestic use, using a variety of measures. Or it may be accepted as a seasonal source of drinking water. Where bacteriological standards are not met it is necessary to determine the cause of the pollution and the possibilities for eliminating it. If no protection can be assured the source can be considered for purposes other than drinking and cooking, eg for washing clothes or bathing. In some cases the sources may have to be rejected for all uses.

3.4. Some areas for further investigation

a) Need for adequate planning

Even though the methods of improving the supplies are often simple, the whole operation must be well planned to avoid as many difficulties as possible. Costs must be worked out beforehand - financial as well as labour and material contributions - so that the communities are well informed and well prepared for what is expected of them right from the start. Aspects which must be thoroughly investigated are procedures for community participation, priority, felt-needs and ownership.

b) Flexible organizational set-up

The organizational set-up and management system proposed must be flexible enough to take into account the varying conditions in the communities. Especially in terms of procedures for community participation there must be emphasis on flexibility and experimentation.

c) Management and maintenance aspects

It is easy to presume that since the improvements to traditional sources are relatively simple and do not require great numbers of staff, expensive equipment, complicated maintenance infra-structure, etc., that the improved sources will function without problems. On the contrary there are bound to be problems, and some inputs may be required resulting in cost and effort on the part of the communities. There must be a well-thought-out proposal for regular inspections, reporting of problems, cleaning operations, etc. More complicated maintenance systems will have to be established if hand pumps have been installed.

d) Integration with health education/sanitation inputs

These aspects will require much thought and effort. Since the water quality can only be improved to a limited extent - through measures such as spring protection, lining of wells, construction of barriers for animals, etc - there is a greater need to ensure adequate health education. An integral part of any programme to improve traditional sources must be a health education/sanitation component, and this must be based on a very sound understanding of local customs and beliefs relating to health/hygiene/sanitation. It can be argued that inputs in these areas would have a very good chance of succeeding if the level of participation anticipated can be achieved. It is, however, a big challenge to work out an adequate programme, given the "deafness" which has developed among the consumers to the usual advice and regulations regarding hygiene, handling of drinking water and sanitation.¹¹

e) Need for an adequate knowledge base on local conditions

Much of the failure of improvements to water supplies can be attributed to a lack of knowledge of the details of everyday life in rural societies, knowledge which should be the starting point for planning improvements to living standards. An adequate knowledge base on such areas as traditional beliefs and practices regarding health, hygiene, nutrition, child-rearing, etc is absolutely essential if meaningful inputs are to be made in rural societies, and if there is any chance of these inputs being accepted and assimilated. A strategy for improving traditional sources will not succeed unless based on a sound knowledge of how rural people,

especially women, actually live- their activities, beliefs, attitudes/values and expectations.

4. CONCLUSIONS

The seriousness of the situation within the rural water supply sector calls for an alternative approach. Improvement of traditional sources would appear to be the only feasible solution at this point in time, given the economic constraints. In spite of the inevitable initial negative response to such a strategy, it is anticipated that the consumers could come to accept it as the only way possible to obtain a reasonable level of reliable improvement to the water supply situation. The implications for community involvement and responsibility, especially of women, and for health education and sanitation inputs are positive, given adequate attention to planning and aspects of organization and management.¹²

FOOTNOTES

1. Tanzania. Ministry of Water, Energy and Minerals. Statement to the National Assembly of Estimates of Expenditure for the year 1984/85, Dar es Salaam, 1984.
2. ILO. Basic needs in danger, Addis Ababa, 1982
3. Ibid.
4. Andersson, I and Hannan-Andersson, C. Development of domestic water supplies in Singida region, Tanzania. Past experiences and future options; Dar es Salaam, IRA, 1984
5. Andersson, I. Wells and handpumps in Shinyanga region, Tanzania, Dar es Salaam, BRALUP. 1982
6. Andersson and Hannan-Andersson, op. cit.
7. Andersson, 1982. op- cit. and Andersson and Hannan-Andersson, 1984. op. cit.
8. Ibid.
9. Andersson and Hannan-Andersson, op. cit.
10. Hannan-Andersson, C. Development of domestic water supplies in Singida Region, Tanzania. The realities for village women, Dar es Salaam, IRA. 1984
11. Hannan-Andersson, C. The ideal vs the reality: health benefits of improved water supply. How to bridge the gap? (Paper presented to a seminar held in Linköping, Sweden, May 29- June 4, 1983. "Water for All - Coordination-Education-Participation")
12. For further discussion see papers: Andersson, I. Wells and handpumps - the Shinyanga experience, 1983
Andersson, I. Improvement of traditional sources: a realistic alternative, 1984
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