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Evaluating for Lessons: Community Water and Sanitation in Swaziland

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ABSTRACT: In order to generate useful lessons for similar interventions, this paper examines the activities and outputs of a water supply and sanitation project in Mayiwane community, northern Swaziland, and presents a brief assessment of project effectiveness. In particular, the paper considers project achievement from the perspective of the components of the project cycle: design, implementation and monitoring. Evaluation findings draw upon a critical review of project documents and progress reports, interviews with a variety of collaborating external and local partners, including community members, and extensive fieldwork.

Four key lessons are highlighted. Firstly, the fact that a rural water system has broken down or needs some rehabilitation should not simply translate into a hasty replacement of non-functional components. While scheme rehabilitation may provide an economic alternative to completely new investments, the decision to reactivate should not be automatic, but should be based on an appropriate trade-off between the cost of rehabilitation and the benefit that will accrue to the community. Secondly, including water supply and sanitation as coupled interventions in a single community project is no guarantee that they will proceed at the same pace. Whether the sanitation component lags behind or shoots ahead the water supply activity depends largely on household demand for the sanitary facility. Thirdly, for rural sanitation, especially in terrains with low depths to water, project planning should take cognizance of site-specific constraints arising from ground conditions and water table elevation, as well as the stability of local superstructure materials, in order to appropriately account for the cost of addressing such challenges. Lastly, projects being implemented by several agencies should be jointly proposed, packaged and monitored by a clearly identified team of representatives, in accordance with a mutually-agreed implementation plan and measurable indicators of success.

INTRODUCTION

Mayiwane community is located in the northernmost Hhohho Region of Swaziland. The Kingdom, extending across the dissected plateau edge of southern Africa, is a small landlocked country bordered by Mozambique to the east and wholly surrounded by South Africa everywhere else (Figure 1). With a total land area of 17,364 sq km and gross national income per capita of US$ 1350, the country has an estimated population of 1.1 million (World Bank, 2005).

In terms of agro-ecological zoning, Mayiwane is situated in the Highveld, one of the four distinct physiographic regions extending longitudinally. The Highveld covers the western third of the country: It is mountainous, with elevations ranging from 910 to 1830 m above sea level and averaging 1300 m. Rainfall in this wettest region ranges from 1010 to 2280 mm/year during the summer months of October to March; its mean yearly figure is 1200 mm. Crystalline igneous and metamorphic rocks, mainly granites and gneisses, underlie the region. The United Nations (1998) estimates that only 10% of the entire area is underlain by soil suitable for arable farming, and just 3% available for intensive agriculture.

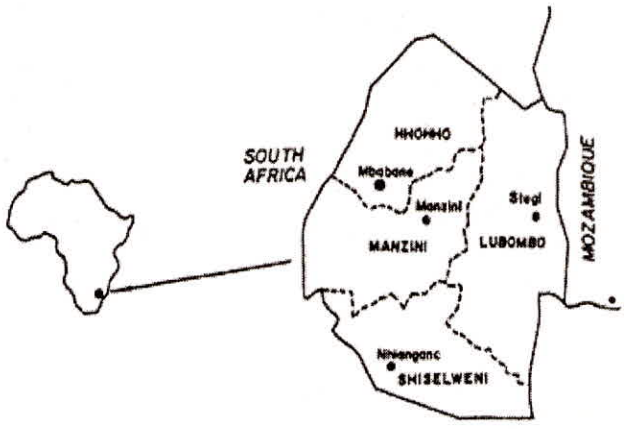

Fig. 1: Swaziland: location map

As is the case with all Swazi rural communities, the Mayiwane community is defined in terms of home-steads coming under the authority of a particular

indvuna or sub-chief. For reasons that include its strategic location at a short offset from the important Maputo Corridor linking Mozambique to South Africa, the community is more closely knit than the average.

It is noteworthy that, in spite of a worsening rural-urban migration trend, 72% of Swazis still live in scattered dwellings in rural settlements where access to basic social services remains low. The World Bank (2005) suggests that only 42% of rural residents have access to safe water, compared to 87% in urban areas. In the case of sanitation, the corresponding levels of access are 44% and 78%, respectively. In the context of these huge services backlogs, the Mayiwane community project—incorporating elements of water rehabilitation, water quantity and quality improvements, and latrine construction—sought to make water and sanitation facilities more widely available to the rural poor, hopefully resulting in better health for individuals and their community.

At the core of that hope of achieving development effectiveness and impact is an interrogation of the post-project situation *vis-à-vis* the envisaged, as part of efforts to generate lessons in incremental steps towards the desire (Sanders, 2003) of integrating evaluation into everyday activities. Consistent with that thinking, this paper establishes the gamut of the project inputs, activities and outputs of the Mayiwane intervention, and presents an assessment of project effectiveness. In particular, it considers project achievement from the perspective of the components of the project cycle: design, implementation and monitoring.

PROJECT SETTING: BACKGROUND AND OBJECTIVES

The original project was undertaken to supply safe water to a population of about 2000 people, as well as a school, clinic and community centre. As was the case with most of the sector projects implemented in the country up to the late 1980s, little attention was paid to the crucial linkage of sanitation and hygiene education to water supply interventions (Busari *et al.*, 1996). Within this context, therefore, the promotion of latrine construction was absent in the original Mayiwane project.

Prior to that initial effort itself, the residents of Mayiwane obtained water from a number of unprotected springs and a stream apparently polluted with runoff from agricultural activities. The constructed scheme sourced water from two springs, which was then gravitated to a 90 m^3 reservoir, feeding a 10.7 km distribution system and 11 standposts. Immediately after commissioning, flow from the springs reduced considerably and had to be augmented by constructing an intake weir across a mountain stream. It is worthy of note that this project adjustment did not incorporate any form of treatment of the stream water, and neither are records available of attempts to ascertain the quality at source prior to construction.

Rainfall figures during the 1991/92 season were relatively low throughout Swaziland. All regions recorded rainfall levels much lower than for the previous season, with several areas showing mean values of more than 50% below normal amounts. The effect of the drought on the water resources situation was more obvious on surface bodies: the flow in principal rivers was reduced to as low as one-half of the previous season's; measured discharges in smaller rivers dwindled to less than one-fifth; and most streams predictably dried up (Busari, 1993). While a critical situation naturally arose in most parts of the country, a more rapid depletion of the traditional water resources in the rural communities led to a water supply crisis in rural Swaziland. Several rural water supply schemes incorporating protected springs, ponds and mountain streams yielded little or no flow. The situation in Mayiwane was typical: the two springs completely dried up while the flow in the mountain stream plummeted.

Although near-normal rains seemed to have returned in places by the mid-1990s, flow in the mountain stream had dropped even further while both spring sources remained dry. The yield from the stream intake was also compromised by leakage underneath the structure: the base of the weir was being gradually worn away. The result of a resort to unsafe water, coupled with the fact only 3% of homesteads had access to sanitary latrines (Government of Swaziland, 1997) was an outbreak of typhoid affecting over 100 people and killing at least five. It was against the foregoing background that a new suite of interventions were planned to include:

- Rehabilitating the intake structure at the source of the water supply system and introducing a slow sand filter;
- Siting and drilling at least one borehole and outfitting a handpump to serve areas not reached because of the low yield from the main system; and
- Constructing 268 pit latrines in homesteads.

With the goal of reducing what the Government of Swaziland (1997) had characterized as a recurrent incidence of water-related diseases in the area, the one-year project phase being focused upon in this paper sought to accomplish the following objectives:

- Improve both the quantity and quality of water supply to the community;
- Ensure that all members of the community have access to potable water supply;
- Raise community awareness of the importance of safe water supply and sanitation in the prevention and control of diarrheal diseases; and
- Ensure that all the community members have access to and use pit latrines.

APPROACH TO EVALUATION

The scope of this evaluation exercise encompasses the following:

- Identifying the outputs achieved from project implementation, specifically in the terms of improvements in the water supply and sanitation situation in the community;
- Examining as much as possible, to what degree constructed facilities are utilized by the targeted homesteads; and
- Generating lessons that could be useful in the planning and implementation of similar rural water supply and sanitation interventions.

Setting out to accomplish the forgoing tasks, project documents, progress reports and inter-agency correspondence in the files of the principal partners—government and external support—were reviewed. Information obtained was supplemented by discussions with officials of the collaborating agencies closely associated with the project at the district, country and international levels. Field assessment of the water supply and sanitation interventions was carried out with the assistance of national and local officers involved with project support and supervision, and with the full participation of one community representative. Field work was conducted in three parts:

- Technical examination of the components of the water supply and pit latrine infrastructure;
- Interviews with community members regarding latrine construction and water system rehabilitation, as well as their perspectives of community-level management and scheme operation and maintenance; and
- Observations of water supply periods and related water use patterns.

In view of the specific objective of improving the quality of water available to the community, water samples were collected from a communal standpost, the mountain stream source of the rehabilitated system, another stream that presents itself as an alternative and convenient source of water, and two hand-pumped boreholes. Water quality analysis was carried out by standard methods at the main government laboratory. Bacteriological quality involved the determination of total and faecal coliform counts while the physico-chemical spectrum covered the range of parameters and aqueous species coming normally under the focus of the laboratory and sector institutions.

PROJECT INPUTS, ACTIVITIES AND OUTPUTS

Project Inputs

The resources utilized by the project are categorized here by their origin and ultimate use within project elements. However, it has not been easy to gather information on details of project finances and person-months contributed, partly because project management had not captured the data in the manner required and partly due to an intermittent project implementation.

Community Inputs

The inputs to the project from members of the community include:

- Provision of labour for the building of homestead latrines, borehole protection, intake rehabilitation, and construction of slow sand filter;
- Payment of token fee in cash towards the cost of materials for latrine construction, amounting to about US$ 1.5 per latrine;
- Contribution of local materials for the latrine superstructure;
- Settling of the costs of operating and maintaining all facilities, including the cost of repairs and spares; and
- Establishment of, and participation in, a water supply and sanitation management structure for the scheme.

Government Inputs

The inputs of government came from its health and water departments as follows:

- Deployment of professional staff for project implementation, including health inspectors, engineers, technicians and community development officers;
- Settling the cost of geophysical investigations for one borehole and of pump-testing the drilled hole in order to ascertain its hydraulic characteristics;
- Purchase of one handpump and appurtenances for installation and protection, including concrete units, fence and gate;
- Procurement of materials for latrine construction for homesteads beyond the 268 catered for by the funding agency;

- Supply of anti-termite concentrate to treat pits inundated with termites in at least 40 homestead latrines;
- Provision of cement for lining the collapsing sides of pits in at least 45 latrines, due to unfavourable subsurface conditions; and
- Settling project administration costs, including that of running vehicles for the movement of personnel and construction materials.

External Agency Inputs

The inputs of the funding organization to the project include:

- Payment for the drilling of one borehole to a maximum depth of 100 m and the installation of steel casing to the required depth;
- Procurement of materials, including vent pipe, wire mesh, and cement and reinforcing bars for slab, for the construction of 268 pit latrines; and
- Provision of materials for the rehabilitation of water scheme intake structure and the construction of slow sand filter.

Project Activities

Sanitation

Following project launching at the Chief's kraal, initial community mobilization for effective participation in project activities was undertaken by community development agents from government. To facilitate smooth supervision and monitoring of latrine construction, the project area was partitioned into five smaller localities: Lozimvu, Magengeni, Mkhuzweni, Ntokozweni and Mayiwane central.

In the first six months of implementation, a total of 223 homesteads had been identified for latrine construction and 187 reinforced concrete slabs cast. Consistent with a generally positive initial community response, the proportion of homesteads which had dug pits was recorded as high as 75%. Within those six months, 125 of the homesteads with pits were supplied with cast slabs from predetermined construction points. In that period, however, no single latrine was fully completed. Save for a few homesteads in Magengeni and Ntokozweni which had embarked on the construction of latrine superstructure of their own volition, assistance for materials was requested by the generality of community members.

The progress in the sanitation component after one full year is indicated in Table 1, showing the number of latrines which construction had been initiated in all five localities, together with the corresponding number of completed latrines. Since less than 10% of the anticipated 268 pit latrines were fully in place even after a year, it is obvious that this activity had been bedeviled by a number of problems. Prominent amongst the factors which slowed down the pace of latrine completion are the following:

- Common wood, the cheapest local material used to erect the superstructure, was being attacked and destroyed by termites;
- Attempts by field officers to arrange donations of treated timber from companies in the region to community members were considered at variance with government policy concerning donations;
- Resort to the alternative use of mud-bricks for superstructure construction was hampered by low community interest in the slow moulding process and lack of the means to mould the bricks;
- Even where homesteads had been sufficiently motivated to start putting up mud-brick structures, the absence of latrine roofs ensured that most of the structures were destroyed by heavy rains;
- Many homesteads underlain by very soft geologic strata were confronted by collapsing pits while others had their dug pits inundated with termites; and
- There was some degree of apathy towards latrine construction, probably because of a lack of understanding of the benefits of latrines *vis-à-vis* the seemingly cost-free option of open defecation in the bush.

Table 1: Latrine Construction Progress after One Year

Locality	*No. of Latrines Started*	*No. of Latrines Completed*
Lozimvu	15	0
Magengeni	30	6
Mkhuzweni	79	2
Ntokozweni	36	10
Mayiwane central	63	7
Total	223	25

During an additional year of project extension, government resorted to using its own funds to procure anti-termite concentrate for treating pits with a heavy infestation of termites. Also, in places with poor subsurface conditions, government arranged to line the collapsing sides of pits. Table 2 shows the status of the latrine construction at the end of the extension, that is, after two full years following project commencement.

The proportion of the total number of completed latrines that belongs to the original project target of 268 is not apparent. However, in terms of the expanded spread of homesteads, about 23% of all latrines were complete. Even though that represents a slight improvement from the first project year, the level of progress after yet another year lends credence to the factor of apathy as a critical impediment to this activity.

Water Supply

The drilling of a deep borehole and installation of steel casing was undertaken by government as part of the agreed cost-sharing already alluded to. Also, a government department carried out geologic, hydrogeologic and geophysical survey for borehole location. Although there is reference to an eight-hour pump test performed to determine borehole performance parameters, no records are available of the generated time-drawdown data or the inferred values of yield and time of recovery to total drawdown.

Table 2: Latrine Construction Progress after Two Years

Locality	*No. of Latrines Started*	*No. of Latrines Completed*
Lozimvu	25	2
Magengeni	37	11
Mkhuzweni	118	24
Ntokozweni	51	20
Mayiwane central	99	18
Total	330	75

Prior to handpump installation in the drilled hole, the targeted homesteads were mobilized to participate in the activity. In accordance with local sector practice, a specific water and sanitation committee was constituted to interface with field staff from government, to organize unskilled labour for borehole protection, and to ultimately take on the role of dealing with scheme operation, maintenance and management. The committee established by the community comprised seven members—two men and five women—and had a female chairperson. As its name suggests, the committee was also expected to provide a channel for the successful promotion of latrine construction in the homesteads benefiting from borehole water supply. Collecting US$ 4.0 from every beneficiary homestead as (annual) contribution towards scheme management, the committee committed itself to settling operation and maintenance bills.

Sources at Swaziland's Ministry of Health believe that the number of people served by the installed handpump is as high as 500. However, investigations in the community found that only about half that figure actually benefit from that source of water supply.

A separate and much older water and sanitation committee exists for overseeing the operation and maintenance of the reticulated scheme. That group was therefore directly involved in the mobilization of unskilled labour for the construction of the intake structure, as well as in the promotion of latrine construction in homesteads served by the scheme's distribution pipelines.

Project outputs

Of a total of 330 Ventilated Improved Pit (VIP) latrines started in five localities in the area, only 75 were completed. The government since adopted the VIP as Swaziland's standard latrine, although with certain modifications: first, playing down the VIP air flow principle to accommodate the average Swazi aversion to dark latrines and, second, allowing homesteads to mount preferred seats over their pits.

Because no one appears sure of the cost of each pit latrine to the homestead, especially in terms of the cost of the locally gathered superstructure materials, it is difficult to compute the *actual* per capita cost of a complete pit latrine. However, taking cognizance of the cost to the funding agency *only*, that is, covering the supplied items of cement, reinforcement, vent pipe and fly screen, the per capita cost comes to about US$ 2.0.

A new intake weir was eventually constructed across the mountain stream, upstream of the location of the previous structure. Again, whatever method of arriving at any figure of the per capita cost of rehabilitation needs some explanation. Fact is, the slow sand filter was not constructed; even if it were, only a population of about 1000 now benefit from *intermittent* water supply from six standpipes, as opposed to the envisaged 11 standpipes reaching 2000 persons. For purposes of mere illustration, assuming complete scheme rehabilitation—incorporating a slow sand filter but serving the lower population of 1000—the per capita cost would have been of the order of US$ 1.0.

As already noted, one borehole was drilled and outfitted with a handpump. The handpump, complete with concrete apron, bucket stand, diversion ditch and drainage into a soakaway pit, is fenced in and provided with a gate. Based on a served population of 250 persons, the per capita cost of the borehole-handpump is about US$ 10.0 or half of that if the government figure of the number of served persons is

used. An important development previously alluded to is the setting up of a water and sanitation committee by homesteads benefiting from handpump water supply. Subsequently, an operation and maintenance fund was established, paving way for scheme management at community level.

TRACKING THE PROJECT CYCLE

Project Design

The project in focus formed part of an African region-wide support to promote community-based water supply and sanitation projects in areas hit by epidemic diarrheal diseases. The elements of the project designed by the Swazi team—water system rehabilitation, water quantity and quality improvement, and latrine construction, with some hygiene education, in the face of a typhoid outbreak—constitute a worthy response within the support framework.

The inclusion of a rehabilitation component for a water supply system with original design weaknesses dating back several years is significant, although this move is weakened by the continued use of an unreliable source. Whereas the original distribution outlay made provision for 20 standpipes and only 11 were constructed, stream flow remained low and water supply intermittent. An even more disturbing situation is the complete absence of any form of treatment of the stream water at the outset.

There are no records in government departments relating to the engineering design and drawings for the rehabilitation of the water system. Officials attribute this lapse to the unavailability of the relevant maps and orthophotos at the time of preparing the project proposal. It is not clear though why this lapse has since not been rectified, even if only for the sake of project documentation. The glaring lack of such clear guides to the construction crew is responsible, in part, for the *laissez faire* attitude adopted towards scheme rehabilitation as evident in the continued absence of a slow sand filter.

While the promise of better water quality could be found in the introduction of a filtration tank, relocating the intake structure was not anywhere shown to be able to increase the available yield. The project objective of ensuring that all members of the community have access to potable water supply is, therefore, rather ambitious from the perspective of the design of the interventions.

Project Implementation

Since its commencement, the project seemed to have gone on forever. None of the activities had its accomplishment tied to some well defined timeframe. Thus, an ad hoc approach to project implementation was inevitable. Over a two-year period, of the three project activities, only one of them—borehole drilling and handpump installation—was seen to fruition.

It remains to the credit of the collaborating partners though, that handpump water supply was made available to some 250 persons for whom the rehabilitation of the larger scheme would have made very little sense. All five standpipes previously supplying water to those homesteads and others (now served by two new government-funded handpumps) long ceased to deliver.

Considering that one of the more critical objectives of the project was an improvement of the quality of water reaching the community, the strange absence of the planned slow sand filter is unfortunate. Interviews with government officials suggest that the materials procured for constructing the slow sand filter were put aside because the yield of the stream source was considered too low. In the light of the fact that such low yield didn't stop the construction of a new intake weir in any case, that explanation appears very weak indeed.

Beyond the preparation of a common proposal for funding and the succeeding project launching, the galvanization of efforts between the health and water teams to coordinate and monitor project activities was inadequate. This is partly responsible for the situation in which on the one hand, community members were strongly motivated towards the water supply interventions while on the other hand, largely ignoring meetings to discuss problems relating to latrine construction. The foregoing trend is strangely at variance with the observations (Busari *et al.*, 1996) that intra-governmental coordination in water supply and sanitation development worked very well at the field level.

In particular, the effect of the lack of linkage between the implementation of the water supply elements and the promotion of homestead latrine construction is evident in the opportunity lost to stimulate demand for pit latrines using the water supply interventions as springboard. Judging by the progress made with the sanitation component, project implementation did not manage to actualize the original project dream of interventions combined in one single package, with the promise of lower cost and

greater impact than the components would have individually.

In any case, as shown by sector experiences in general, a plan to undertake water supply and sanitation interventions as a coupled programme is no guarantee that they will proceed at the same pace. Whether the sanitation component lags behind or shoots ahead the water supply activity depends largely on household demand for the sanitary facility.

Project implementation experience from Mayiwane confirms that, while the convenience and other advantages of potable water supply may be obvious and the desire for it may require little stimulation, homesteads need considerable persuasion to be convinced of the merits of owning a pit latrine. Health and hygiene education efforts will certainly need to be strengthened if the health benefits of improved sanitation are to be understood by community members, and if health considerations are to constitute a strong influence on their decision to construct (and use) pit latrines.

Project Effectiveness

Facility Use

All three handpumps, including the one installed under this project, are being used by the beneficiary homesteads. In fact, users of the handpumps are scattered over the areas once served by the reticulated water supply system. These handpumps have become the only sources of potable water supply to many parts of the community because the 90 m^3 reservoir fed by the large scheme is shut off intermittently in order to enable some standpipes in regions of lower elevations to receive water. It is important to note, therefore, that while for several of the homesteads reduced travel time did result form these interventions, this improvement cannot be generalized even among the intended beneficiaries.

Predictably, homestead interest in the use of the handpumps decreases with increasing distance from the water points. The result is that an undetermined number of homesteads find the (unprotected) Lugongodwane stream a more convenient alternative. Bacteriological tests of this source give faecal and total coliform counts, respectively, as 33 and greater than 200 per 100 ml. Even if viewed against the most relaxed drinking water quality guidelines, the indicated level of contamination is obviously high. In fact, the continued use of the stream as a water supply source negates the very basis of the project interventions.

There is ample evidence that pit latrines are being used by those who have constructed them. Indeed, in some of the homesteads where the only structures are concrete slabs simply placed over pits, and in some others where the superstructure is only partially complete, residents are already using the latrines. An examination of homestead latrines indicates careful maintenance in many cases, pointing to the likelihood that those who have been motivated enough to build latrines, are convinced of the health benefits of improved sanitation.

Water Quality

To convey a general picture of the post-project situation of water quality in the area, standard bacteriological and physico-chemical tests usually focused upon by government laboratories, have been conducted on samples from six water supply sources. The water samples have their origin as follows:

- The mountain stream source of the reticulated supply (sample #1);
- One of the communal standpipes fed by the reticulated system (sample #2);
- The borehole-handpump installed under this project (sample #3);
- An existing school borehole-handpump (sample #4);
- New government funded borehole-handpump (sample #5); and
- The Lugongodwane stream which offers an alternative source of water to portions of the project area (sample #6: bacteriological test only).

Tables 3 and 4 furnish, respectively, the water quality of the identified sources with regard to bacteriological and physico-chemical indices. With respect to water quality guidelines, the water chemistry in Table 4 shows no anomalous levels. However, apart from water from the handpump the project helped to install, the turbidity recorded everywhere exceeds the 5 FTU recommended in national guidelines (Government of Swaziland, 1999). In particular, the turbidity of water from the handpump newly outfitted by government (sample #5) is rather high, even if just falling under the maximum permissible limit of 25 FTU advised by the World Health Organization (1994).

Table 3: Bacteriological Water Quality

Sample Number	*Coliform Count*	
	Total	*Faecal*
1	23	15
2	20	13
3	2	0
4	0	0
5	24	10
6	>200	33

As the most important indices of drinking water quality in this rural area, results from the bacteriological tests deserve a closer examination. The government-funded borehole, for which a high turbidity level has already been alluded to, is faecally polluted, most likely resulting from the process of borehole drilling and/or handpump installation. Pathogenic load in the Lugongodwane stream is understandably high, and faecal pollution could even worsen with increased human activity in the catchment. Judging especially from bacteriological quality, it appears that standpipe water quality represents no improvement over the stream source feeding the system. However, during periods when standpipes are dry, there may be recourse to the more polluted Lugongodwane stream.

In real terms, water quality can only be said to have improved for the homesteads continuously benefiting from supplies from the three new borehole-handpumps, including that installed as part of this project.

Table 4: Chemical Quality of Water (mg/l)

Parameter	*Sample Number*				
	1	*2*	*3*	*4*	*5*
Manganese	0.5	0.3	0.5	0.2	0.8
Total iron	3.3	0.6	3.3	1.2	3.3
Flouride	0.1	0.1	0.3	0.7	0.2
Sulphate	7.0	46.0	0	0	8.0
Nitrite	23.0	13.1	23.0	19.7	55.8
Nitrate	0.7	0.5	0.9	0.3	0.7
Chloride	16.0	14.0	17.5	21.5	17.0
Bicarbonate	70.2	37.1	48.8	94.6	76.3
Alkalinity	115	210	80.0	155	125
pH	7.2	7.1	6.8	7.1	7.6
Total Dissolved Solids	75.4	71.8	115	171	140
Turbidity (FTU)	23.0	15.0	0	9.0	23.0
Conductivity (mhos/cm)	116	111	177	263	214

LESSONS AND CONCLUSIONS

In the light of the highlighted project activities and of the evaluation findings presented herein, a number of lessons could be drawn. It is hoped that such lessons enumerated hereunder—as they relate to the approach to programming and the components of scheme rehabilitation and latrine construction promotion—will find useful application in the planning and implementation of similar community water supply and sanitation projects.

APPROACH TO PROGRAMMING

- Community water supply and sanitation projects, or any development projects for that matter, being implemented by two or more agencies, should be jointly proposed, packaged and monitored by a clearly identified (but small) team of representatives, in accordance with an implementation workplan and measurable indicators mutually agreed during project planning.
- It is erroneous to assume that a water supply scheme incorporating communal standpipes will always assure a higher level of service. Community members will settle for a few hundred metres walk to the continuous supply from a handpump, rather than wait for the intermittent supply from a large reticulated system.

REACTIVATING WATER SYSTEMS

- The fact that a water system has broken down or is found to need some rehabilitation should not simply translate into a straightforward replacement of non-functional components. While it is true that such rehabilitation may provide an economic alternative to completely new investments, the decision to reactivate should not be automatic but should be based on an appropriate trade-off between the cost of rehabilitation and the benefit that will accrue to the community.
- Scheme rehabilitation projects, especially the relatively more complex, which do not have documented engineering design and drawings to reflect the nature of the affected appurtenances in relation to the entire system, may run into hitches.

MARKETING SANITATION

- Problems relating to the promotion of sanitation and the actual physical construction of pit latrines differ from community to community. A good project proposal should take cognizance of site-specific constraints arising from ground conditions, water table elevation, and stability of local superstructural materials, in order for project planning to include the cost (to the community and/or the intervening agencies) of addressing such problems.
- The fact that a single community project includes water supply and sanitation as coupled interventions is no guarantee that they will proceed at the same pace. Whether the sanitation component lags behind or shoots ahead the water supply activity depends largely on household demand for the sanitary facility.

- A health-related water supply and sanitation project that aspires to be successful must incorporate a sanitation promotional strategy, including hygiene education, within a framework of close coordination among the collaborating agencies.

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