

HAI DISTRICT WATER SUPPLY PROJECT

A

MODEL OF COMMUNITY RURAL WATER SUPPLY

INITIATED

BY

A CHURCH IN TANZANIA

A paper prepared and presented by Eng. Rogers C. Marandu at the workshop of Faith Schools Water Sanitation and Hygiene, held at Sarum College Salisbury - England 5th – 7th July 2009.

TABLE OF CONTENTS

List of Figures and Tables	iii
Chapter 1	1
Introduction.....	1
Water supply and sanitation in Tanzania.....	1
Water supply in Hai District.....	2
How the Evangelical Lutheran Church in Tanzania – Northern Diocese (ELCT – ND) chipped in to the project.....	2
Chapter 2	4
Project Execution.....	4
Awareness campaigns during the implementation stages of the project.	5
a) Introducing the project to prospective beneficiaries:-	5
b) Formulation of Village Water Committees:-	6
c) Formulation of Board of village water users committees representatives	7
The achievements obtained after the implementation stage of the project.....	10
Chapter 3	12
Education on Water Hygiene and Environmental Sanitation in schools colleges, churches and mosques:-	12
A. Quality of drinking water:-.....	12
B. Water related diseases and how to prevent them:-	13
C. Environment Conservation and Sanitation:-	14
The achievement of educating people “On water Hygiene and Environmental Sanitation”.....	16
Chapter 4	18
Operation, maintenance and sustainability of the water supply schemes.....	18
Praises or appreciations from the water users for the donation of water supply project.	20
Performance appraisal for year 2006 to 2008.....	22
Conclusion	24
Appendix 1	Error! Bookmark not defined.
Appendix 2	35
Appendix 3	36

List of Figures and Tables

- Figure 1: Sample of water supply Board of trustees organisation chart
- Table 1: Year 2006 results of performance appraisal for the four water supply trusts
- Table 2: Year 2007 results of performance appraisal for the four water supply trusts
- Table 3: Year 2008 results of performance appraisal for the five water supply trusts

Chapter 1

Introduction

Water supply and sanitation in Tanzania

In Tanzania the service of clean and safe water is still not very good as the majority of the population are dissatisfied with the poor services of existing water supplies either in Urban centres or in rural areas.

The National census of year 2002 indicates that only 42% of the Tanzanian population living in rural areas of the country are accessible to improved sources of drinking water such as piped water supplies or protected springs and wells.

For the case of urban centres 85% of the population living in towns and cities are accessible to piped water.

The poor performance of the sector of water supply was mainly due the following:-

- Inappropriate water law
- Lack of enough funds to invest in the sector of water supply both in physical and human man power development.

- Socialist policy of free water
- Centralised system of water supply.

Lack of clean and safe water for drinking and inadequate sanitation has lead to illness and loss of productive time as a result those affected cannot generate an income. Water crisis or problems in Tanzania has contributed much to the country's position of being one of the world's poorest countries.

The Government has now realized and recognises the importance of improved water supply and better sanitation in poverty reduction. The year 2005 "**National strategy for Growth and Reduction of poverty**" considers water and better sanitation as a key factor in social economic development and the fight against poverty. One of its stated targets is to increase access to safe clean and affordable water to 65% of the population in rural areas and 90% to the population in the urban areas by 2010.

Water supply in Hai District

The Hai District water supply project is located in Tanzania, Kilimanjaro Region, Hai District.

- How was the situation in Hai District before the start of the project.
 - There were fifteen water supply schemes which were built way back in the nineteen sixties and nineteen seventies which were all aged and in absolute conditions.
 - The District population census year 2002 were 260,000 who were living in the coffee banana belt fetching water from traditional irrigation furrows polluted and contaminated by animal and human waste, fertilizers and pesticides while those living in the savannahs, plain areas were depending on river water contaminated and also polluted.
 - Diseases induced by the polluted and contaminated water were:-
 - Faecal oral – cholera, typhoid, amoeba
 - Water scarce – diarrhoeas, dysenteries, scabies, pin worm, typhus and ascaris
- According to the population census of year 2002, 94% of the people living in Hai District have at least access to toilet facilities which are mostly pit latrines. This good situation of Hai District has developed from the favourable condition of good incomes which are higher than the national averages due to the fertile soil of the slopes of Mt. Kilimanjaro with productive coffee and banana plantations; also high education standards compared with other Districts in Tanzania.

How the Evangelical Lutheran Church in Tanzania – Northern Diocese (ELCT – ND) chipped in to the project.

The project was initiated by the church (ELCT-ND) in co-operation with the beneficiaries' way back in 1987/88 with the objective to supply clean and safe water to Bomang'ombe township which is the headquarters of Hai District.

The church (ELCT-ND) had to look for donors to assist in funding the water supply project and fortunately the German protestant church and the Government of Germany agreed to finance the project in a joint venture with the Tanzanian Government (Four parties financed the project - two churches and two Governments). The first phase of the project started physical implementation in 1992 and was completed in 1996.

With the successful implementation of phase one the German and Tanzanian Governments agreed to continue with rehabilitation of all existing water supply schemes in Hai District to a level of being able to supply up to 90% of the population living in Hai District with clean and safe water by the year 2015. At the moment the project is in phase IV- 2 of its implementation stage and it has been able to supply 242,025 people with clean and safe water.

Chapter 2

Project Execution

The project of Hai District water supply has been implemented under the Steering Committee – the chairman of the committee is the Kilimanjaro Regional Commissioner and the co-chairman is the Retired Bishop of the Evangelical Lutheran church in Tanzania – Northern Diocese Dr. Erasto N. Kweka. The committee secretary is the District water Engineer for Hai and co-secretary is the retired secretary of (ELCT-ND) . The other committee members are representatives of the central Government, Hai District authorities and religious institutions in the project area.

The consultancy services are provided by CES – Consulting Engineers Salzgitter GmbH from Germany.

The consultant is responsible for:-

- **Preparation of the project** in co-operation with the beneficiaries
- Planning of the project in collaboration with local experts and in co-operation with targeted beneficiaries.
- Implementation of the project in collaboration with local experts and in co-operation with beneficiaries.
- **Sensitization and awareness** campaigns on “Water Hygiene and environmental Sanitation “in the targeted community.
- Training of
 - ♦ Village water committees
 - ♦ Board of trustees
 - ♦ Public tap agents
- Facilitating the trustees in the recruitment of permanent staff who will be responsible in the operation and maintenance of the completed schemes. The staffs are trained during the project implementation (on-the-job training) so as to be well equipped with the necessary knowledge and technical know-how in relation to the respective needs and requirements of the scheme.

- Facilitating the legal form of organisation to operate maintain and sustain the new water supply schemes.
- Carrying out annual performance appraisal for the water supply trusts which are independent to evaluate their performances.

Awareness campaigns during the implementation stages of the project.

During the preparation stage of implementation of the project, education, sensitization and awareness activities had to be carried out for the successful implementation.

The following activities were carried out:-

a) Introducing the project to prospective beneficiaries:-

- The leaders who are within the targeted project area both political and administrative were educated through holding seminars.
- The religious leaders both Christians and Muslims were educated through holding seminars.
- The beneficiaries were educated in general village meetings.

Information conveyed to the participants of the seminars or meetings while introducing the project to them are:-

- Why do they need a supply of clean and safe water and what types of water related diseases are affecting their community targeted for the project.
- The coverage areas of the water supply project – they are informed of all villages and sub-villages to be supplied by clean and safe water including educational and health institutions.

- The type of structures and installations to be built and installed in their villages and sub village for example water reservoirs, pressure reducing tanks, the different types of valves and water meters to be installed.
- How to safeguard and protect their project construction materials from theft for example materials such as cement, sand, aggregates, reinforcement bars, concrete blocks, pipes and fittings etc.
- Why the project financiers do not give compensation to the land used and plants uprooted during the construction of the water supply project.
- Why the project implementation needs self help contribution in pipe trenching, back filling and ferrying of construction materials to the sites where vehicles can not reach.
- Why beneficiaries have to pay for their water according to consumption.

b) Formulation of Village Water Committees:-

Village water committees for the water supply schemes are formulated based on the Tanzanian National water policy of year 2002 (A village water committee should be of ten members'; - five women and five men)

The eligibility for appointment of village water committee members:-

- He/she must be of aged 18 years and above
- Education not less than primary education.
- Must have a conduct of being trustful, dedicated, committed, respected, reliable, countable and transparent.
- Must be a resident of the village covered by the water supply project area.
- Have a will to assist in the operation and maintenance of the water supply.
- Must have a vision to see a reliable water supply system supplying clean and safe water.

The chairman of the village water committee members will be elected by the village general meeting for the election of the village water committee members. The candidates for the election of the chairman of village water committee should be nominated from the ten elected members. The elected chairman will automatically be the board member for the water supply trust.

Village water committees are educated on “their responsibilities and duties” such as:-

- How information from the beneficiaries should flow from bottom to top and vice-versa
- Transparency of the trusts’ budget
- How to assist the trusts management in improving the collection efficiency of raised monthly water bills.
- How to assist the trust’s management in minimizing the unaccounted for water
- How to assist the trust’s management in scrutinizing and approving private house water connections
- How to operate and maintain the public taps in their respective villages.
- How to protect and conserve the water sources and forests
- How to improve environment sanitation
- How to dispose of the solid wastes and liquid wastes generated in their respective villages.

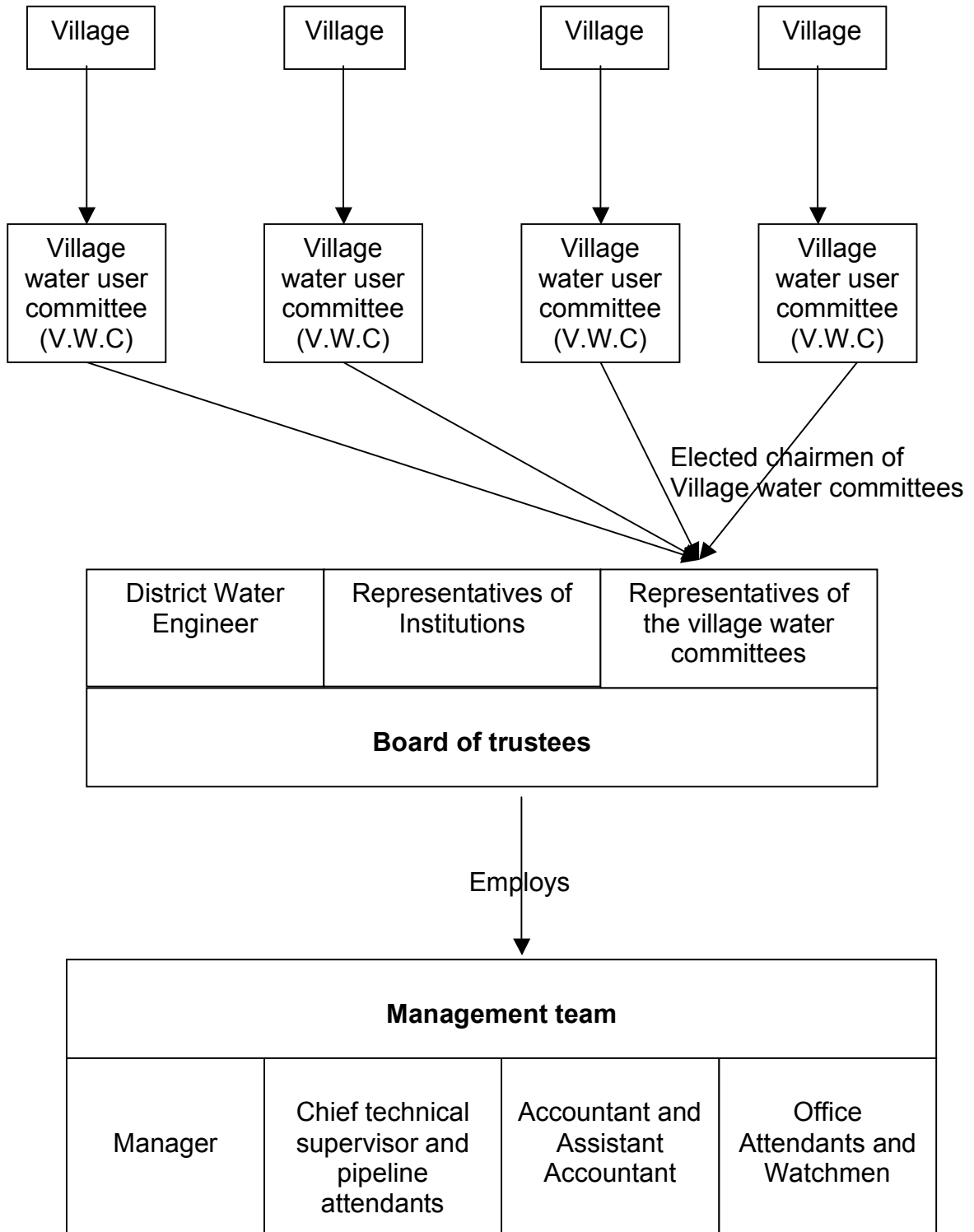
c) Formulation of Board of village water users committees representatives

The Board of village water users committees’ representatives is formulated by the chairmen of the village water committees along the water supply project area. This Board of village water users’ committees’ representatives is transformed into Board of trustees once it’s legally registered.

The Board of village water users committees’ representatives are **educated** on their “duties and responsibilities” such as on how:-

- To employ qualified staff for operation and maintenance of their water supply project.
- To set up targets to be achieved for the planned activities to be executed.
- To assess skills of the employed staff
- To make sure the management team is able to supply clean and safe water to users continuously throughout the life span of the project.
- To set up annual water tariffs which are affordable to the water users and which can cover operation, maintenance and depreciation costs of items with life span of ten years.
- To acquire land titles for the areas where water structures are constructed such as water reservoirs, offices and water sources catchment areas.
- To go through their annual budgets and approve them.
- To make sure information flows from bottom to top and vice versa.
- To work in close co-operation with the central Government and local authorities in order to achieve their set goals.
- To protect and conserve the water sources and the environment
- To educate their water users on the strengths, weaknesses, opportunities and threats of their water supply entities.
- To dispose of the solid wastes and liquid wastes generated in the villages and market centres within the project area.

Figure 1: Sample of water supply Board of trustees organisation chart



The achievements obtained after the implementation stage of the project.

Achievements for the water supply schemes after project completion and in operation includes:-

- The supply of clean and safe water is reliable and continuous.
- Customers or water users are satisfied with good service rendered by the village water committees, Board members, and the management.
- Great improvement in reduction of unaccounted for water (average losses for the five independent entities in the year 2008 was 15%).
- Eligible and qualified water committees were elected for every scheme.
- Eligible and qualified Board of trustees were elected for every scheme.
- All activities planned to be executed by self help were completed as per scheme implementation time schedule.
- The sense of scheme ownership was achieved by the villagers who executed their project by self help.
- Villagers are responsible for security and safeguarding of their water supply project installations and structures.
- Beneficiaries are willing to pay for their water according to consumption in order to raise money for operation maintenance and sustainability of their scheme. Example of collection efficiency for the year 2008.

* Uroki Bomang'ombe water supply entity	95.4%
* Losaa – K.I.A water supply entity	97.6%
* Magadini Makiwaru water supply entity	100%
* Lawate Fuka water supply entity	100%
* Lyamungo Umbwe water supply entity	99.6%

- All public taps were constructed as per the Engineers specification and beneficiary's ideas.
- All public taps were fenced by the beneficiaries before being opened for supply of water
- No more complaints from the beneficiaries for travelling more than 500 metres from their premises to go and fetch water.
- No vandalism and sabotages of the water supply system.
- Water supply schemes are operated maintained and sustained by the funds raised through beneficiaries paying according to consumption without subsidy from donor or Government.
- Water users are aware of water sources conservation and protection and also environmental conservation.
- Water users are aware that their water is clean and safe and no need of boiling
- Water users are satisfied with the service rendered by their public tap agents
- Public tap agents keep records of their daily and monthly water sales
- All five independent Boards of trustees are able and capable of setting tariffs which are affordable to their water users.

Chapter 3

Education on Water, Hygiene and Environmental Sanitation in schools colleges, churches and mosques:-

The project stepped-in to educate the project beneficiaries on Water Hygiene and Environmental Sanitation. The seminars were conducted in primary schools, colleges, churches and mosques surrounding the project area.

Water is a very important substance to support our life, without clean and safe water for drinking we will not survive or our life span will be very short.

Project water supplied to users is chemically and bacteriological free from diseases as it has to under go all required tests by the World Health Organisation before being supplied.

You can survive for only about 5 to 7 days without water and food

(John 4:7 Jesus told the Samaritan woman to give him drinking water because he had wearied from his long journey)

Education is the backbone of every nation for the development of its nation either scientifically, culturally, economically, technologically, politically etc.

For a nation to eradicate ignorance, diseases and poverty it has to build schools with the basic needs and water is one of the essential basic needs

The seminars also highlighted the following issues to the beneficiaries:-

A. Quality of drinking water:-

All water project beneficiaries were educated about the quality of drinking water by considering:-

- Where to get safe and clean water
- How to make drinking water safe
- Water storage
- Water collection and transportation.

Where to get safe and clean water:-

From water sources which are protected and prevented from pollutions of sewage, animals and chemicals.

The project has tapped clean water from springs and rivers which are in the Kilimanjaro rain forest belt free from human pollution, the water is transported by means of pipes.

How to make drinking water safe

Contaminated water should be treated – project water is treated by using the chemical chlorine and the water is safe for drinking.

Water storage:-

Project water reservoirs are regularly cleaned and sterilized as per the engineers maintenance and operation instruction manual.

Water collection and transportation.

A lot of time is spent in collection of water and such water is contaminated:- the project has reduced time of fetching or collection of water by constructing public taps which are within a walking distance of less than 500 metres.

B. Water related diseases and how to prevent them:-

Before the project was initiated and implemented common diseases were: - Cholera, Typhoid, Amoeba, Dysentery, Diarrhoeas, Scabies, Trachoma, Fluorosis, Skeletal deformities, etc.

People were taught that the major cause of existing diseases were the use of contaminated water.

Water Users after been taught are now aware that drinking, cooking and bathing water should be kept far away from human faeces and waste water from latrines.

People were also taught that their families should keep drinking water in clean utensils or containers which are covered and should not allow people to drink water direct from storage containers.

- **Water pollution** – people have been taught and made aware that water has been polluted by people by:-
 - Discharging domestic and industrial effluents into surface water and underground water.
 - The use of chemical fertilizers in farms close to water sources.

- **People were informed on measures towards controlling water pollution such as:-**
 - Discouraging the use of chemical fertilizers, pesticides, herbicides near the water sources.
 - To avoid oil running into the water sources (springs, rivers and furrows)
 - To discourage clearing and establishment of settlement in the water sources catchment area.
 - To control and discourage people dumping wastes into water bodies such as lakes, rivers, springs sea etc.

- **Personal Hygiene**

People are taught and informed that several diseases can be prevented by observing hygienic rules or principles such as:-

 - Washing hands after defecating
 - Washing hands before meals and before handling food.
 - To bathe every day, brush teeth and wash clothes.
 - To live in a clean environment.

C. Environment Conservation and Sanitation:-

- **Environmental sanitation**

Students and pupils are taught and informed how:-

 - To collect all rubbish and how to dispose them by burying them properly and not by burning.
 - To sweep and clean their houses.
 - To cut the grass around their houses
 - To fill open ditches
 - To construct a storm drainage for their school and for their homes.
 - To construct a pit latrine or toilet for their school for their homes and how to make use of them.
 - Animal faeces should be buried underground

- **Effects of not conserving our environment**

People are taught and informed of the major problems that will occur if the environment is not protected:-

- Depletion of flora and fauna as well as global warming
- Deforestation which is a great problem which degenerates the forest
- Environmental pollution
- Social degradation

- **Importance of forests and other plants**

People are taught and informed the importance of forests and other plants such as:-

- Trees and forests protect the disappearing or diminishing of the ozone layer caused by carbon gases.
- Forests and trees acts as flood control
- Forests modify the climate of the place as they contribute to the rainfall formation and conserve moisture.
- Forests form a protective cover to the ground and hence prevent soil erosion from degrading the surface of the earth.
- Forests provide natural habit for wild animals and birth of different varieties.

- **Agents of deforestation:-**

- People are informed that the agents of deforestation can be natural and human factors.

The achievement of educating people “On water, Hygiene and Environmental Sanitation”

The case study of educating primary schools:-

An evaluation of fact finding was conducted in the year 2008 after completing the exercise of educating all primary schools supplied by clean and safe water in the four independent water supply schemes basing on:-

- The use of clean and safe water
- Environmental sanitation
- Personal Hygiene.
- Environmental conservation

The number of primary schools visited during the exercise of evaluation was 80 as follows:-

- | | | |
|----------------------------------|---|--------------------|
| - Uroki Bomang'ombe water supply | - | 20 primary schools |
| - Losaa – K.I.A water supply | - | 27 primary schools |
| - Magadini Makiwaru water supply | - | 15 primary schools |
| - Lawate Fuka water supply | - | 18 primary schools |

The outcome of the evaluation was as follows:-

- **The use of clean and safe water**
 - On the use of clean and safe water for drinking - Average score was 100%.
- **Environmental sanitation**
 - To collect all rubbish in the school compound or yard and disposal by burying – average score 40% where most of the rubbishes are burnt.
 - Sweeping and cleaning the class rooms – average score was 50% as they only concentrate on cleaning the floor and forgetting to clean the wall and ceiling.
 - Cutting grasses around the school yard or compound – average score 80%
 - Provision of drainage system – average score 80%
- **Personal Hygiene**
 - Cleaning toilets, pit latrine – average score was 50% as they are not properly cleaned due to lack of proper tools.
 - Bathing, brushing teeth and washing clothes – average score 60%
- **Environmental conservation**

- Tree planting in the school area – average score – 60%
- Establishment of tree nurseries – average score 20%
- Tree planting in the water sources catchment areas – average score - 0%
- Planting trees for fire wood - average score - 0%

Chapter 4

Operation, maintenance and sustainability of the water supply schemes

For the follow up of the performance of independent water supply schemes, there is an annual performance appraisal exercise conducted to evaluate each scheme basing on the following areas:-

- The operation and maintenance of the water supply system
- Financial management
- Customer care
- Water sources protection and conservation

The outcome for the four consecutive years (year 2006 up to 2008) annual performance appraisals has revealed that all four independent water supply entities has various Strengths, Weaknesses, Opportunities and Threats as follows:-

STRENGTHS

- Capable Board members and management teams that are able to operate, maintain and sustain the water supply system.
- Water users are able and willing to pay their water according to consumption (average collection efficiency is above 96%)
- The water supply system structures and installations are well safeguarded and protected from vandalism and theft by water users.
- Tapped water sources are reliable and have not been affected by droughts.
- The water supply systems are still intact and in good operational condition.
- Strong and good support of central Government, Local authorities and religious institutions.
- Accurate metering of all points of abstraction
- Transparent financial management to maintain customers' confidence.

WEAKNESSES

- A few water users and public taps agents unwilling to fence their public taps by planting bougainvillea fences and fixing gates
- Majority of storage tanks and pressure reducing tanks are not demarcated and permanently fenced.
- Lack of land titles or right of occupancy for land used for construction of water supply structures and installations including offices.
- Lack of marker poles for the vital installation like chambers of air valves and pipes laid.

OPPORTUNITIES

- Availability of local manpower to operate, maintain and sustain the water supply systems.
- Availability of good water policy and good governance.
- Availability of infrastructure such as communication, roads, electricity etc.
- Availability of water users.

THREATS

- Tremendous increase of population growth within the water sources catchment area
- Deforestation activities in the rainforest belt of Mount Kilimanjaro.
- Floods interrupt the supply during heavy rain seasons
- Un-coordinated decisions made by higher authorities of constructing Government and private institutions which demand high quantities of water which was not considered during planning stages
- Slow rate of paying monthly water bills by Government Institutions
- Lack of reliable water sources for future expansion.

IMPACTS / ACHIEVEMENTS of supplying clean and safe water.

- Has tremendously decreased the work load of women by releasing them from going long distances to fetch water
- Has increased school attendance by releasing children from going to fetch water for their families.
- Has tremendously improved the health standards of the water users by decreasing water related diseases.
- Has influenced investment in various sectors like education, health and construction of new houses.

Praises or appreciations from the water users for the donation of water supply project.

- People now get a reliable continuous service of clean and safe water.
- The water service has now improved tremendously the health standards of the water users; nearly all water related diseases are almost eradicated.
- People are now much cleaner bodily and their clothes than before when comparing with the period when they had no piped water (**water has improved personal hygiene**)
- Repair of leaking pipes are well attended in time because of good management of the system
- Nearly all employees of the water supply trusts are rendering their services in an honest and transparent manner.
- Village water committee members have proved to be the central focal pillars of the Board of trustees in safeguarding the water supply system and in assisting the management in water bills collection especially in following up the defaulters or debtors in their respective villages. (**They have assisted in improving the collection efficiency**)
- Now the school children can study comfortably without being disturbed to go and fetch polluted and contaminated water from furrows and rivers for cleaning their school and for cooking meals.
- The employed staffs of the trusts have proved they can render good service without being corrupted.
- The employed staffs of the trusts have proved to be hard working, dedicated and competent.
- People are now getting continuous clean and safe supply of water near their residence
- The water project has improved the income of women as they can now do other activities of income generating for their families.
- People in the lower or dry areas can get their daily meals in time because water is available for cooking their food. Before they could only get one meal in a day because of unavailability of water.
- Children born after the completion of the project are now having white clean teeth because of drinking water containing fluoride which is within the required W.H.O. standards.

- The awareness educating campaigns conducted by the consultant in public meetings, schools, churches and mosques were of great importance for the sustainability of the water supply system.
- The educating campaigns made by the consultant through the radio program has made the beneficiaries/water users able to understand a lot of things about their water supply entities such as:-
 - How to elect members of the village water committee in a democratic way
 - How to elect the chairperson of the Board of trustees in a democratic way
 - What is safe and clean water?
 - How to conserve and protect water sources
 - How to conserve and protect the environment by planting trees instead of cutting trees
 - Customer care
 - How to disposal solid and liquid wastes