rural development
& land reform

Department:
Rural Development and Land Reform
REPUBLIC OF SOUTH AFRICA

HIPPO WATER ROLLER IMPACT ASSESSMENT REPORT - 8 SELECTED SITES (EC).

Chief Directorate: Technology Research and Development

Sub-Directorate: Rural Technology and Innovation

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1. Introduction

1.1 Water: The Limiting Factor

Freshwater resources are an essential component of the earth's hydrosphere and an indispensable part of all terrestrial ecosystems. Water is needed in all aspects of life. The general objective is to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases. Innovative technologies, including the improvement of indigenous technologies, are needed to fully utilize limited water resources and to safeguard those resources against pollution.

For many, clean water comes with the twist of a tap. However, ensuring that rural dwellers around the world do not have to walk for hours to collect sufficient and safe drinking water is a huge challenge. Considerable investments have been made in rural water supplies: Springs have been protected; wells have been dug or drilled, and fitted with hand pumps; piped water schemes have been constructed. However, the sobering fact is that progress is still much too slow, and rural water supply coverage significantly lags behind that of urban water supply.

1.2 Water Supply Infrastructure

The layout of traditional rural settlements presents significant challenges in respect to the provision of water services per the existing RDP standards since many deep

rural areas are characterized by scattered households located predominantly on hillsides above the flood planes to avert sub-tropical diseases associated with humid climates and water bodies. Up to 2,7 million people (6% of the national population) live in such scattered patterns, currently clustered into over 15,000 groupings of settlements. The remainders of rural settlements are classified into over 7,500 small villages (less than 5,000 people each) and over 500 larger rural villages; with more than 5,000 people each (The Eastern Cape Economic Profile and Outlook, 2010). To provide each household with even the most basic water supply service is a complicated and costly exercise. Where possible, local groundwater resources, protected springs and/or rainwater harvesting methods are used to address the most dispersed settlement areas in the short term. In the longer term, settlement development should be influenced by providing incentives for densification or, where necessary, relocate some of the most inaccessible households to nearby settlements. Many of the larger villages are also located on hillsides and generally have unplanned layouts. The soil conditions are mostly rocky and local water resources are limited. The construction costs are therefore typically high, requiring significant financial commitment from government to achieve the country's target to provide all people with basic water supply infrastructure by 2014.

1.3 The Future Path of Development

The Government has insufficient funding for large, centralized water treatment and supply plants. The geographical, hydrogeology and the fact that most rural communities or villages are isolated and the households are scattered makes it even more expensive to install treatment and supply plants in those communities. The statistics maintained by DWAF's Planning and Information Directorate in 2008 showed that if targets for delivery are to be met, access to basic water supply needs to rise at 3 times faster than the 2006/07 rate of 1 million people to 5.2 million people a year in 2009. These are extraordinary challenges and require extraordinary methods and initiatives.

Many people are forced to carry water to their homes often over long distances. Heavy 20 litre buckets are carried on their heads causing long-term injuries; it is

mostly women and children who are affected. This traditional method is very strenuous and time consuming. Thus there is a need to identify alternative technologies appropriate for rural areas that can be used for improving the quality of water and supply thereof. Science and technology innovation has a great potential to improve the welfare of rural communities by addressing their day-to-day challenges including those related to safe drinking water supply.

2. The Role of Science and Technology in Development

2.1 The Need for Rural Technologies

The analysis of the need for promotion of rural technology would result in focusing on the basic necessities of people. We can separate five elements of social and economic infrastructure, which should be taken care of effectively by the local bodies and central government. They are – health, education, drinking water, housing and electricity. Followed by these the need for roads, efficient agricultural output, employment at grassroots level and telecommunication cannot be neglected as well. All these goals of rural development converge towards development of effective rural technologies and a sound rural education to absorb the technological innovations. Any developing country cannot become developed without the development of its rural base. Rural regions in our nation are still deprived of electricity and basic necessities. Modern technology has not touched the lives of people even after eighteen years of democracy. We have to ensure that rural beneficiaries are not just introduced to new technologies but also entrusted with their use.

3. The Department of Rural Development

3.1 National Development Objectives

The Department of Rural Development and Land Reform (DRDLR) has been given the mandate by the President of South Africa to develop and implement a Comprehensive Rural Development Programme (CRDP) throughout the country. To achieve this mandate the DRDLR embarked on developing a fresh approach to rural development. The CRDP is focused on enabling rural people to take control of their destiny, with the support from government, and thereby dealing effectively with rural poverty through the optimal use and management of natural resources. Addressing water scarcity and quality calls for an intersectional and multidisciplinary approach to water resource management. The approach needs to ensure the coordinated development and management of water and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

Technology Research and Development (TRD) Chief Directorate is one of the new units that has been created within the DRDLR to enable the implementation of the CRDP strategy as indicated above. The unit is tasked with a specific mandate to conduct research and development on technologies that could be deployed in rural areas for development and achievement of quality of life for all. As part of its mandate in this regard, TRD identified Hippo water rollers as an appropriate technology that can be rolled out in some of the CRDP sites facing the challenge of water supply.

4. Technology to Improve Access to water

4.1 Technology Description

The Hippo Water Roller is a container designed to transport 90 liters of water. It comprises of a drum with a large screw-on lid and a clip-on steel handle. The drum is manufactured from UV stabilized Polyethylene and has been designed to withstand typical rural conditions such as uneven footpaths, rocks and broken bottles. The large opening (135 mm) allows for easy filling and cleaning of the interior. The sealed lid ensures hygienic storage. The steel handle provides firm control over difficult terrain while pushing or pulling the roller. The innovative

design allows the water to be placed inside the "wheel" rather than carried above the wheel. The 90kg weight of water is borne on the ground resulting in an effective weight of just 10kg on level ground.

Fig.1 Hippo Water Roller

4.2 The Intervention (Hippo Water Roller) Need

In South Africa many communities do not have access to water. Consequently:

- People walk considerable distances to fetch water.
- They must carry it on their heads or on wheelbarrows over difficult terrain.
- Hours are spent each day fetching water.
- It impacts all facets of life: health, hygiene, schooling, cooking, washing, and food production.
- It impacts severely on women and children.

4.3 Benefits of the Hippo Water Roller

- Carries more water more easily than traditional methods.
- The container lasts for 5 years and more.
- Saves substantial time and energy.
- Prevents long-term injuries caused by carrying heavy loads.
- Provides a flexible infrastructure to access multiple water points throughout the year.
- Beneficiaries experience the benefits of the Hippo roller immediately.
- Empowers women and children enabling them to attend more school and break free of the poverty cycle.
- Emancipation of women and children**:** More men are participating in fetching water. Women have time to do more in less time and children have time to play and do homework.
- Heath Benefits: Removes long-term injuries caused by heavy burden of water resulting in premature ageing of the spine.
- There is now greater potential for growing vegetables.

4.4 Technical specifications

- Manufactured in *polyethylene* material
- 90L Water capacity
- Made for tough rural conditions
- Includes still handle which is rust-free
- Blue in colour

- Includes 5 year guarantee

5. Project Background

5.1 Eastern Cape Provincial profile

5.1.1 Overview

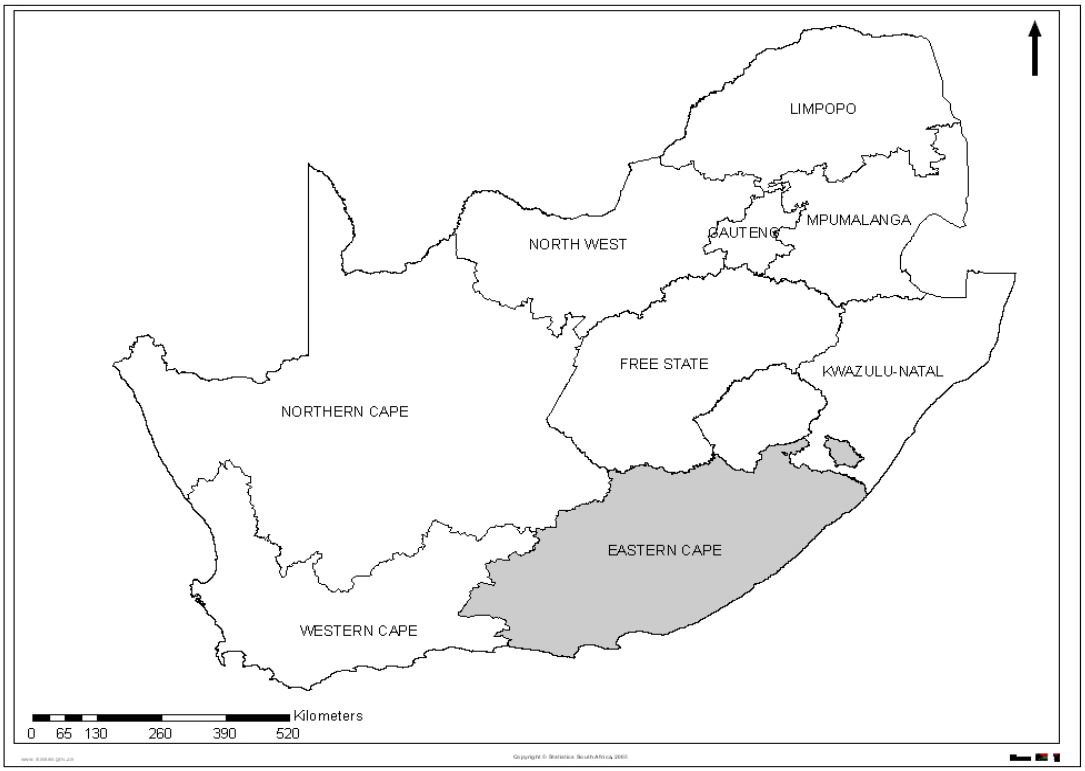

Fig. 2 Map of the South African provinces showing the location of Eastern Cape Province.

The Eastern Cape is located in the south-eastern part of South Africa and is divided into six district municipalities, namely: Alfred Nzo, Amatole, Cacadu, Chris Hani, O.R. Tambo, and Ukhahlamba, and a metropolitan area called Nelson Mandela Bay. The Eastern Cape provides easy access to four other provinces in South Africa, namely the Western Cape, the Northern Cape, the Free State and KwaZulu-Natal, and also shares an international border with the Kingdom of Lesotho. The province is richly endowed with farming land. However, some of the challenges the province faces include the availability of electricity, water and sanitation infrastructure. 350 Hippo Water Rollers were procured using the quotation procurement method and delivered to 8 selected sites in the Eastern Cape Province.

5.2 Baseline information on the 8 selected sites for the project.

5.2.1. Mbutye and Mkhathazo

Mbutye and Mkhathazo are amongst the villages set to benefit from the project. These two villages are under the jurisdiction of the Amathole District Municipality and the administrative area of Mbashe Local Municipality. There is great agricultural potential in the two areas. However, despite their potential there is a high unemployment rate due to lack of infrastructure and access to water. On Quality of Life, these areas score well below the Provincial average across all measures. The provision of basic services (water, electricity, sanitation, and refuse removal) is poor, and access to health care and particularly to education facilities is limited.

5.2.1.1 Access to Water

Households continue to access water through boreholes, dams, rivers, streams and only a limited number practice rainwater harvesting, this is limited to households that do not have thatch roofing.

5.2.1.2 Access to Energy

The majority of the population uses paraffin and candles for lighting. Wood is mainly collected and used for cooking purposes.

5.2.1.3 Access to Sanitation

Open fields are used for waste management. There are no pit latrines nor bucket latrines. These areas have high incidences of water borne diseases.

5.2.1.4 Types of Dwelling

Traditional dwellings have been the most common type of accommodation for households and are dominant in the two areas, with an exception of several informal dwellings.

5.2.1.5 Levels of Education

The majority of the people in the district have no education, and the rate of growth still remains negative. Since 2000, there has been no significant change in the number of people with Grade 12.

5.2.2 Nqalweni Village

Nqalweni Village falls under the administrative area of Umzimvubu Local municipality. The municipality is located in the central part of Alfred Nzo District Municipality and it is more rural. The majority of the population own livestock and arable land. Soil types and climatic conditions are suitable for cattle and goat farming, the cultivation of cut-flowers, sorghum, maize, oil and protein crops, lucerne, potatoes, cabbage, tomatoes, citrus and tropical fruits, nuts, pineapples and chicory. But, as elsewhere, the identified potentials represent Local and District Municipalities' IDP wish lists, rather than actual farming and production realities.

5.2.2.1 Access to water

People at Nqalweni source their water from dams, rivers and/or streams. This constitutes 49.6 percent of the total population of the District Municipality without piped water in their yards or on community stands. Long distances are covered in

order to access water sources even though the water quality is not suitable for human consumption.

5.2.2.2 Access to Energy

The Area still uses candles for lighting. Fire wood is collected at a distance away from home; the wood is utilized only for cooking purposes and to boil water for children in preparation to go to school. Paraffin is also another source of energy although it is a luxury due to its scarce supply.

5.2.2.3 Access to sanitation

The majority of the population does not have access to even a pit or bucket latrines. Individuals relieve themselves in open fields or hidden places close to their water sources, increasing the incidence of waterborne diseases, adversely putting their hygiene in jeopardy.

5.2.2.4 Types of Dwellings

Traditional dwellings are the most common type of dwelling in the village, with an average growth of 65.9 percent.

5.2.2.5 Levels of Education

The number of people with no schooling has increased, only about 13 percent of the total populations have at least reached secondary school and less than 5 percent ended in junior primary school.

5.2.3 Thorha (Mjikelweni) and Ntibaneni Villages

The two villages are under the administrative area of the Engcobo local municipality. The municipality is located in the eastern part of Queenstown and is one of the poorest municipalities under Chris Hani district municipality. The rural poor in the two mentioned villages have many challenges in their livelihoods. The levels of unemployment and the crisis of poverty, the two amongst others not mentioned prompted the initiation of co-operatives around the areas. The co-operatives are largely dominated by women comprising 72 % of the scheme and 28 % being males.

5.2.3.1 Access to Water

Water supply infrastructure including communal taps were installed in the villages, however, community stands around these villages remain ornamental since there is no supply of water. These communities rely largely on dams, rivers and/ or streams which are also frequented by domestic animals. Rainwater harvesting is another method practiced in order to get water supply. This practice is only limited to households with a gutter and zinc roofing.

5.2.3.2 Access to Energy

About 31 percent of people use paraffin for energy. 48 percent have electric connections. Since paraffin is a limited energy source, other sources such as wood, dried cow dungs are also used especially for cooking.

5.2.3.3 Access to sanitation

There are no flush or chemical toilets around the two areas. More than 75 percent of the population still continues to use pit and bucket latrines and other unspecified ways of waste management. Conditions have not improved since.

5.2.3.4 Types of Dwellings

55 percent of the population around two areas had access to housing, while the remaining 45 percent dwell in traditional huts or structures made of traditional material.

5.2.3.4 Education levels

There are low levels of education in the villages. The highest grade passed being grade 12.

5.2.4 Mqokolweni Village

Mqokolweni village is under the jurisdiction of Joe Gqabi DM and the administrative area of Elundini Local Municipality (ELM). The municipality is bounded by Lesotho and Senqu Municipality in the West, Chris Hani District Municipality in the South, O.R. Tambo District Municipality in the East and Alfred Nzo District Municipality in the North. ELM covers an area of 5,064 square kilometres and has 17 wards and according to the CS 2007 the ELM accommodates an estimated population of 123

600 people in 35 553 households. The municipality is the fourth poorest in the province, with the poverty index of 42.0.

5.2.4.1 Access to water

There is no piped water on community stands, the population rely on Tsitsa River which also poses a challenge of drying out. Alternatively rainwater harvesting is practiced in order for water security. Difficulty is seen by communities that have thatch roofing. This causes them to walk long distance to other water sources in order to access water.

5.2.4.2 Access to Energy

Wood collection has been practiced over decades and is still the only reliable source of energy especially for cooking. Candles are largely used for lighting. Only a few households use paraffin for both cooking and lighting as most residents do not have an income and the cost of paraffin being too high and delivered to locals after a long period (Locals wait for paraffin to be distributed for 3 or more months).

5.2.4.3 Access to sanitation

35 percent of the population has access to pit latrines and the remaining 65 percent are still practicing the bucket system and also defecate at open fields. This causes implications especially when it’s raining, water run-offs from heavy rains transport the waste materials to nearby water sources used by the local communities, thereby compromising the quality of water which adversely causes water borne diseases.

5.2.4.4 Types of dwellings

Traditional huts have been a cultural preference throughout history. However the majority of houses are brick structures. There are no informal dwellings present.

5.2.4.4 Education levels

Elundini has the lowest levels of education in the District, with 68% of the population having only received a primary school education. There is a lack of educational facilities. The high school is a few kilometers away. The lack of education facilities is further exacerbated by the dilapidated condition of present

facilities, especially some of the schools. One mud primary school was eradicated a few kilometers near the villages and was named after the local Chief.

5.2.5 Ntabankulu (Ndlantaka village) and Ingquza Hills

The two Municipal areas are under the jurisdiction of O.R Tambo district municipality. These areas and villagers experience extremely low socio-economic conditions for region with high development potential in the agriculture, forestry and tourism sectors. Under good management and with utilisation of existing natural resources the areas could reduce its unemployment rate by 50% in 10 years.

Ntabankulu and Ingquza hill score well below the Provincial average across all measures but have adequate shelter and schools. Access to schools is higher than the District average and comparable to the Eastern Cape average. The provision of basic services (water, electricity, sanitation, and refuse removal) is poor, and access to health care facilities is very limited.

5.2.5.1 Access to Water

The provision of water is a still a challenge to the district municipality. Villagers still access their water largely from dams, rivers and/streams. Like all the other rural areas from different local municipalities rainwater harvesting is limited to structures made of bricks with zinc roofing, since there is also a challenge of water sources drying up. Communal taps also remain ornamental as there is no supply of water.

5.2.5.2 Access to Energy

The lack of access to electricity is eminent with an approximate 80% of the population making use of wood. Other sources of energy such as paraffin for lighting and candles are still in use.

5.2.5.3 Access to sanitation

There is a lack of proper waste management: These areas require more attention and more efforts in order for them to be clean and healthy environments. Waste is still defecated on open fields near water sources. Only minority utilize pit latrines.

5.2.5.4Types of dwellings

Traditional dwellings have been the most common type of accommodation for households. Brick structures represent an average of 16 percent of all dwellings and informal dwellings have been the least common accommodation with an average of less than 1 percent.

5.2.5.5 Education level

Despite adequate schools these areas still posse low levels of education. Children are involved in agricultural co-operatives; this is attributed to some of the households without parents. Children who are middle aged have to play vital roles to their siblings.

6. Beneficiary selection Criterion

TRD was assisted by RID and STRIF officials in selecting the communities that would benefit from the intervention. The selected project sites lack basic services and are the most underdeveloped of all other villages. Different selection criterions were used from the selected sites. The beneficiaries in the selected villages were then selected by the Council of stakeholders, councilors and the traditional leadership. Table 1 below shows the selection criteria and number of Hippo rollers received in each village.

Table 1 Selection criteria used to select beneficiaries in each village

6.1.1 **PROJECT SITES**	**QUANTITY**	**SELECTION CRITERION**	**WST[1] AND DISTANCE**
Village (s): Mbutye and Mkhathazo **District Municipality:** Amathole **Local Municipality:** Mbashe	Mbutye **25 units** Mkhathazo **25 units**	• Old aged people who are mostly women. • Males who are living alone. • Males who do not have spouses and live with their children. • Children without parents	**RIVER** ≈ 3.5 km
6.1.2			
Village (s): Nqalweni **District Municipality:** Alfred Nzo **Local Municipality:** Umzimvubu	**50 units**	• Aged individuals both males and females. • Child – headed homes. • Males who do not have spouses and live with their children.	**RIVER** ≈ 4 km
6.1.3			
Village (s): Mjikelweni and Ntibaneni **District Municipality:** Chris Hani **Local**	Mjikelweni **25 units** Ntibaneni **75 units**	• Garden cooperatives that are part of the food security project • Poorest households.	<u>Mjikelweni</u> **RIVER** ≈ 5 km <u>Ntibaneni</u> **COMMUNAL TAPS** ≈ 200m

[1] Water Source Type

Municipality: Engcobo			
6.1.4			
Village (s): Mqokolweni **District Municipality:** Joe Gqabi **Local Municipality:** Elundini	**50 units**	• Households that do not have JOJO tanks. • Poorest households. • Aged individuals both males and females. • Villages with few households to enable sharing of the intervention.	**RIVER** ≈ 3 km
6.1.5			
Village (s): Ndlantaka **District Municipality:** O.R Tambo **Local Municipality:** Ntabankulu	**50 units**	• Males who do not have spouses and live with their children. • Old aged people who are mostly women. • Child – headed homes.	**COMMUNAL TAPS** ≈ 1 km
6.1.6			
Village (s): Lubala **District Municipality:** O.R Tambo **Local**	**50 units**	• Villages with few households to enable sharing of the intervention. • Old aged people who are mostly women.	**RIVER** ≈ 1 km

Municipality: Ingquza		• Children without parents.	

7. Costs

The project cost was a total sum of R500, 195.15 incl. vat and the budget breakdown of the project is as follows:

- 500 Hippo water rollers incl. delivery = R496, 695.15
- 350 A5 branding stickers = R3, 500.00

8. Project Impact Assessment methodology

An insight into people's concerns, motivations and aspirations was gained using qualitative research. Instruments such as focus group interviews, conversations and observations were the formal approaches that were used in the study. Meetings dates were scheduled prior to the visits. The groups together with the researchers honored the dates and time. Conversations were conducted in a form of semi and un-structured interviews. Questions were asked in order to have an understanding on the impact of Hippo rollers on the focus groups particularly regarding the way it enables families and quite simply, makes life easier and also how much of a key solution it has been predominantly when taking into account the terrain of these rural dwellings, distance travelled to water sources, rain patterns, capacity of water needed on a daily basis and adversely the uses of water and other alternative methods that were used prior the introduction of the technology (refer Appendix 1).

9. Summary of Findings

This report documents findings which are a summary of the observations done by the project team and the issues that were raised by the community members.

Benefits derived from the Hippo Water Rollers intervention

I. Not every individual has a wheelbarrow in possession; the introduction of Hippo rollers enables the beneficiaries to easily carry the water aided by the rollers.

II. Often water is normally fetched by women and/or children especially girls of child-bearing age, this stereotype has changed drastically since the introduction of the intervention in that even males assist in fetching water, this is because it can easily be rolled which makes carrying on the head a myth.

III. A larger capacity of water can be fetched and this would cover for all house-hold activities, i.e. cleaning, cooking, bathing and irrigation of backyard crops.

IV. Clothes are routinely washed in rivers, this is the normal practice in rural areas by rural communities, since the implementation of water rollers, community members are able to fetch water in large quantities to enable them to wash in their house-holds.

V. At Mqokolweni village Hippo water rollers are used bysome community members in their small businesses; they are being utilized in the manufacturing of bricks used for building huts.

VI. The adoption of this technology has reduced incidents of spinal pains, backaches and hand blisters caused by carrying heavy 20 L buckets of water.

VII. A great distance is travelled by rural communities to fetch water; rollers have also reduced trafficking to and from the water source on a daily basis for water.

VIII. Kids also find delight in collect water using the Hippo water roller. An innovative toy to rural kids.

IX. At Mqokolweni 1 Hippo roller is shared amongst 3 or 4 households, this shows the level of acceptance the intervention has received. The expectation is that the DRDLR will still deliver more Hippo rollers for the rest of community members.

Challenges faced with regards to the intervention

I. Steep slopes execute a great challenge when utilizing Hippo rollers especially if travelling up slope; the slope makes the Hippo roller heavy to roll up. However, it is still a better option compared to other methods used in rural areas.
II. At Mbutye the Geo-physical structure i.e. the rocky and narrow path leading to the water sources makes it disadvantageous to roll the Hippo water roller up and down the river for fetching water (See fig 5), the roller is usually left up the surface (several meters away from the water source), and trips are made using 2 to 5 L buckets to fill them up.

10. Discussion

Many rural communities lack access to water for their daily needs. People often walk long distances to a water source and collect water using traditional and regular water devices such as buckets and gallons. Many people suffer from muscle aches and pains instigated by carrying these devices on the shoulders or on the head. To make water transport easier for remote dwellers, a new approach was introduced, not to carry the water tanks but to roll these heavy tanks. The hippo water roller is an aid to transporting water from different sources to households, it is not intended to replace the government's plan to supply all South Africans with water, but it is an interim measure to help communities who have not yet received piped water, or where piped water is at a distance from homes.

The layout of rural settlements present significant challenges when the roller has to be rolled up slope, especially since the condition of the soil in most rural areas is rocky, this can also be attributed to the lack of understanding especially when demonstrating on the dynamics of this intervention. The intervention is suitably manufactured for different rural terrains.

A single Hippo carries enough water to meet the basic needs of five people per day, and gives them access to better living conditions. In addition, Hippos make it possible for families, cooperatives and schools to collect enough water to irrigate their food plots. Fewer trips to collect water means women and children can spend more time on productive educational and economic activities.

The benefits of this South African award winning innovation are immediate and so is its potential to impact positively on the long-term negative effects of not having access to clean water. A child is now healthy enough to attend school on a frequent basis because they are not sick or bound to water-fetching activities. An adult is able to work longer hours on their land, increase their yields, and become active participants in their country's economy by being able, in some cases, to double their rate of production.

Once asked by an enthusiastic supporter what Grant Gibbs' wildest dream was, Grant (the owner of the technology) replied by saying that it was "to reduce the number of people without adequate access to water by 1%. Whilst 1% might not seem ambitious enough, "when you consider that according to the United Nations (UN), more than 1 billion people do not enjoy the luxury of water on tap, it would require the distribution of 10,000 Hippo Rollers per month for ten years to reduce the suffering endured by just that 1%. Clearly the need for such innovation is enormous and the benefits of the Hippo Water Roller are endless. The Hippo Water Roller Project will continue to be a winning solution to achieving sustainable development in Africa and across the rest of the world for years to come.

However, the Hippo water roller serves as a water supplier, thus there is still a need to partner it with a water purifying technology appropriate to rural areas.

11. Conclusion

Water is essential to sustain human life. It plays a vital role in many human activities, including, agriculture, energy, and sanitation, in addition to sustaining ecosystems that provide valuable services to both environment and human. For poor people, water scarcity is not only about droughts or rivers running dry. Above all, it is about guaranteeing the fair and safe access they need to sustain their lives and secure their livelihoods. Hippo water rollers were well accepted by all the beneficiaries. It is indeed an appropriate innovative technology for most rural areas in South Africa,

12. Recommendations

The provision of Hippo rollers to the selected communities created an excitement in these communities, thus, there is a need to supply more Hippo water rollers.

TRD’s mandate is to pilot innovative technologies at a small scale, RID and STRIF officials in provinces may roll-out these technologies at the rural areas facing similar challenges. The technology is owned by a South African company that has exclusive rights over the technology. Thus, it can either be procured through direct sourcing or quotation method. The technical specifications detailed in section 4.4 may be used when procuring. TRD is also available to assist directorates when procuring. Appendix 1shows the agreement the service provider is willing to enter with the DRDLR whereby 2 Hippo rollers can be procured for the price of 1.

JOJO tanks are preferred interventions in rural community for harvesting water in that they would cater for the vast majority of rural dwellers. However this cannot be executed as a result of the manner of the roof that is applicable to the majority of the rural house-holds.

It is recommended that the roll-out of the Hippo water rollers be partnered with other appropriate water purifying technologies. TRD can advise on available appropriate technologies.

13. Pictures

Fig 3. Kids fetching water

Fig 4. Water source at Mbutye village

Fig 5. A narrow and rocky path leading to the river

Fig 6. Bucket used to fetch drinking water

Fig 7. Community members washing clothes at a nearby river

Fig 8. Hippo rollers designed for tough rural conditions

Fig 9. Hippo roller used by the cooperative for irrigation purposes at Mjikelweni village

Fig 10. Households compete for water with animals

Fig 11. Water source used for irrigation and drinking at Mjikelweni

Fig 12. Garden at Mjikelweni

Fig 13. Vegetables

Fig 14. Surface water harvesting method at Mjikelweni