



**Government of the Kingdom of Swaziland
Ministry of Natural Resources and Energy
Department of Water Affairs**

**Water & Sanitation Point
Mapping Pilot Project**

REPORT 2012





FOREWORD



Her Royal Highness, Princess Tsandzile

Water and Sanitation Mapping is an important management tool for the government at all levels, national, regional and local levels as it helps provide government with important information on areas of improvement. The mapping outcomes help government to develop targeted and appropriate intervention strategies for the water and sanitation sectors and to measure the effectiveness of such policy interventions. International Cooperating Partners (ICPs) can also use the mapping information to target their assistance. The mapping is also the voice of citizens on water and sanitation needs. Water-point and sanitation mapping is increasingly being recognized and accepted at global level as a monitoring tool that can help monitor progress towards Millennium Development Goal (MDGs) targets for water and sanitation especially goal 7 dealing with safe drinking water and sanitation.

Weak and piecemeal sector monitoring makes it difficult to measure and understand progress in the water and sanitation Sector. Accurate data is required for effective monitoring of progress. It is the mission of the Ministry of Natural Resources and Energy to provide efficient services on surveying, mapping, and valuation of the resources for the social and economic development of the Kingdom of Swaziland in compliance with the National Development Strategy (NDS). His Majesty's Government recognises water as key catalyst for economic development. However, my Ministry lacks the effective monitoring tool that will measure and understand progress towards our national and International targets. I am reliably informed that the national roll out of the water point mapping will help us address a number of challenges that we face to achieve equitable distribution of water supply facilities.

I have been informed that data collected during this pilot phase of the project, provides statistics on water coverage rates, water point functionality rates, water points densities in different regions and the population being served. This will not only help my Ministry, but all relevant agencies, our co-operating partners and supporters to better plan water sector investments in the different regions.

I am delighted that this report is a result of the collaborative effort by the National WASH partners and I request them to continue working in partnership with the Ministry of Natural Resources and Energy in ensuring that the Water and Sanitation Point Mapping Project is rolled throughout the whole country.

A handwritten signature in blue ink that reads "Damini".

Her Royal Highness, Princess Tsandzile
Honorable Minister for Natural Resources and Energy



PREFACE



Mr. Obed M. Ngwenya

The Department of Water Affairs in collaboration with Water, Sanitation and Hygiene (WASH) implementing partners has been implementing rural water and sanitation projects in the country without having a proper monitoring and evaluation tool. This resulted in a lot of duplication of efforts in the communities. The water point mapping is an important tool to be used to monitor progress towards meeting the Millennium Development Goals (MDG's) and the progress on water and sanitation service delivery in line with the National Development Strategy (NDS).

The Kingdom of Swaziland has just conducted a water and sanitation point mapping pilot project with support from WaterAid, Engineers Without Borders-Canada and the national WASH partners. The data produced from this pilot exercise provides a basis for strategic and more equitable, efficient, accountable and transparent allocation of resources for water point construction and rehabilitation particularly in the areas where the pilot mapping project was conducted. The success of this project is a result of coordination between government, communities and NGOs. The results of the project will assist government with information required for appropriate and targeted investments in the water and sanitation sector.

Overall, water point mapping will strengthen the availability, depth and quality of data throughout the sector. This will help my Department, and relevant stakeholders including our co-operating partners and supporters to plan water sector investments in different regions. The priority for the Department of Water Affairs is to roll the water and sanitation mapping throughout the country. We will need to work together as WASH partners, to ensure that we roll out this project throughout the country.

I would like to thank WaterAid, Cooperating partners and National WASH partners who supported and participated in this pilot project. Finally I hereby invite all WASH partners, nationally and internationally to support the rollout of this project.

A handwritten signature in black ink, appearing to read 'Ngwenya', written in a cursive style.

Mr. Obed M. Ngwenya
Director- Department of Water Affairs



DIFFERENT TYPES OF WATER POINTS MAPPED



1. Drilled bore hole at mbagave community under mkhiweni inkhundla



2. Manyandela handpump under mkhiweni inkhundla



3. Reservoirs at sivumelwano lesisha community water in manzini region



4. Control house at luvu community water project under mtfogwaneni inkhundla



5. Becker elevated steel panel reservoirs at ndzevane rural water supply scheme



6. Stand pipe (siphofaneni umzabalazo wabomake water project)





7. Lamgabhi water project treatment works



8. Play pump at mafutseni (timbutini community)



9. Monitoring well



10. Artesian well at fosini community



*11. Unprotected spring- tikhuba mvubetse community
Matsanjeni inkhundla*



12. Spring protection





13. Completed spring protection maphungwane community

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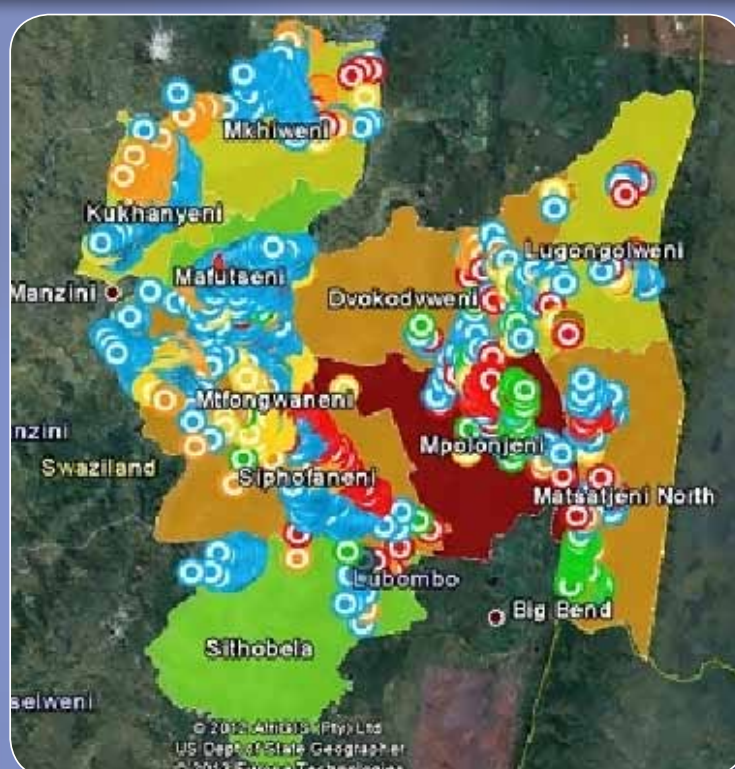


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(I) ACKNOWLEDGEMENTS

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Finally, the Department of Water Affairs would like express its sincere appreciation for the technical support diligently provided by the Department of the Surveyor General and the Central Statistics Office for the successful implementation of the project.



Hon. Minister for Natural Resources & Energy
- Her Royal Highness Princess Tsandzile



(I) ABBREVIATIONS AND ACRONYMS:

GoS:	Government of Swaziland
MNRE:	Ministry of Natural Resources and Energy
MOEPD:	Ministry of Economic Planning and Development
MOH:	Ministry of Health
MOE:	Ministry of Education
MOTAD:	Ministry of Tinkhundla, Administration and Development
DWA:	Department of Water Affairs
SG:	Surveyor General
SWADE:	Swaziland Water and Agricultural Development Enterprise
SWSC:	Swaziland Water Services Corporation
RWSS:	Rural Water Supply Section
RWS:	Rural Water Supply Schemes
WASH:	Water Sanitation and Hygiene
UNICEF:	United Nations Children's Fund
MPP:	Micro Projects Programmes
WA:	WaterAid
EWBC:	Engineer Without Borders-Canada
CSO:	Central Statistics Office
GPS:	Global Positioning System
IRD:	International Relief for Development
IWRM:	Integrated Water Resource Management
SNL:	Swazi Nation Land
TDL:	Title Deed Land
NDDC:	National Development Data Centre
WVS:	World Vision Swaziland
COSPE:	Cooperation for the Development of Emerging Countries
RSCC:	Regional Sector Coordination Committee
MDG:	Millennium Development Goals
NGO:	Non-Governmental Organizations
PWPM:	Pilot Water Point Mapping
UK:	United Kingdom
EU:	European Union
VIP:	Ventilated Improved Pit latrine



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Graph 8	Summary of Findings – Status of Mtfongwaneni Inkhundla Water Points
Graph 9	Mtfongwaneni Inkhundla Sanitation Coverage by homesteads
Graph 10	Summary of Findings – Status of Siphofaneni Inkhundla Water Points
Graph 11	Siphofaneni Inkhundla Sanitation Coverage by homesteads
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List of Pie Charts	Narration
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(V) LIST OF MAPS

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Showing Kukhanyeni Inkhundla Water Point Functionality and Distribution



DEFINITION OF SELECTED CONCEPTS

- **Functional** A water point is deemed functional when it serves the intended beneficiaries.
- **Non- Functional** A water point is deemed non-functional when is it not operational, either broken down or water table dried up etc.
- **Partially Functional** A water scheme that is functional but not in its full capacity. Reasons could be water rationing or the inconsistent flow of water.
- **Tinkhundla** Government institutions (Constituency) where decentralisation of all development activities take place in the Regions.
- **Water Point** A collection structure of water source that is deemed fit for human consumption either a bore - hole, protected spring, hand-dug well, standpipe etc.
- **Reservoir** A large potable water storage
- **Default Payment** Some of the water supply schemes requires electricity for pumping and some of the water points are non-functional due to failure by the beneficiaries to pay for the electricity bill.



1. BACKGROUND

1.1 *The Kingdom of Swaziland*

Swaziland became independent of British protectorate in September 1968. It is one of the few countries in the world operating under absolute monarchy rule. The king is head of state and the Indlovukazi or Queen mother, is the mother of the nation. The country lies along 31°E and 26°S. Swaziland is landlocked between South Africa and Mozambique with an area of 17,363km² and a population of approximately 1, 080,337. Of the total national population 833, 896 people (77.1%) live in the rural areas. The administrative country is divided into 4 main Regions: Hhohho, Manzini, Shiselweni and Lubombo – and they are further divided into 55 administrative constituencies otherwise known as Tinkhundla. In addition, it is divided into 4 agro-ecological / topographic regions namely the Highveld, Middleveld, Lowveld, and the Lubombo plateau with the highest annual rainfalls in the Highveld and the lowest rainfalls in the Lowveld.

1.2 *History of Rural Water Supply Schemes in the Kingdom of Swaziland*

The Rural Water Supply Branch (RWSB) under the Ministry of Natural Resources and Energy (MNRE) is responsible for the mobilization, planning, design, construction, operation and maintenance of the rural water supply system in accordance with the relevant provisions of the National Policies and Strategies. Majority of the water supply schemes in Swaziland rely on groundwater as a source for water supply. Since the construction of the first water scheme in Swaziland in the year 1977, 823 rural water supply schemes (490 macro schemes and 333 micro schemes) have been constructed by the year 2004. The GoS has not had a visual representation of the exact location of the RWSS (JICA, 2004). The result has been a duplication of efforts by the implementing partners leading to some communities with large numbers of water supply schemes while other communities lack schemes entirely. As a means to address this challenge, the government solicited support from potential partners to map all the schemes in Swaziland and indeed found one in WaterAid and its cooperating partners in the year 2008. WaterAid is a NGO based in the United Kingdom but with Regional offices across the world, the nearest office to Swaziland being the Malawi office. WaterAid's broad objective is to transform lives by improving access to safe water, hygiene and sanitation in the world's poorest communities. WaterAid had previously assisted with the mapping of RWS in Malawi since 2002 - and has been working in partnership with Engineers Without Borders Canada on the same issue since 2009. Upon appreciating (through a joint visit to Malawi by Government officials and other partners) how the mapping enhanced planning and implementation of schemes in Malawi, the GoS collaborated with the WaterAid to conduct a similar exercise for the Kingdom of Swaziland.

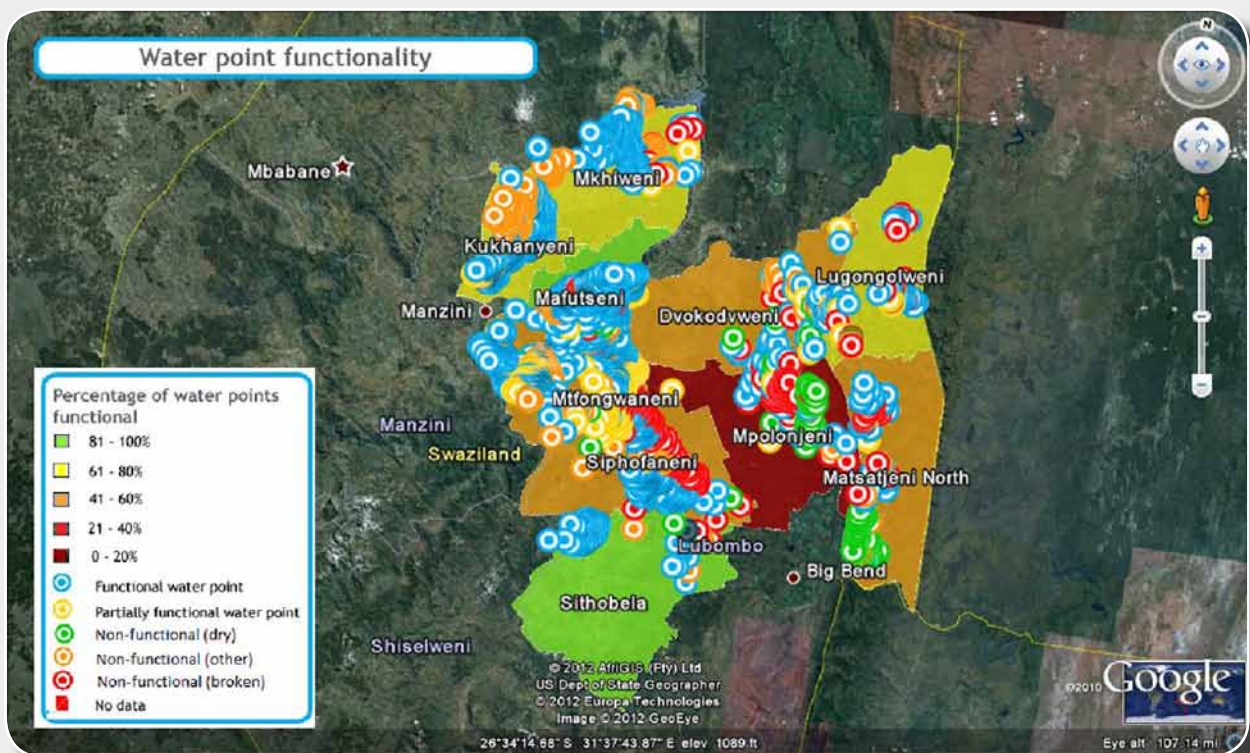


2. EXECUTIVE SUMMARY

This report presents the findings of the pilot water point mapping exercise, that was conducted in 8 Tinkhundla selected from the Manzini and Lubombo Regions of Swaziland. This exercise was carried out from the 14 November to 16 December 2011. The pilot water point mapping exercise sought among other things, to determine the number of water supply schemes that exist and their functionality status. A further goal of the exercise was to compare infrastructure levels with population served in each Inkhundla.

The methodology used for this exercise was the waterpoint mapper tool, water point mapping questionnaire and Global Positioning System (GPS) Gadgets.

2.1 Water Points Coverage Maps and Functionality Status



Map 1 Showing the 8 Piloted Tinkhundla Maps that Shows Water Point Functionality Status and Coverage



TABLE 1 SUMMARY OF FINDINGS – WATER POINTS FUNCTIONALITY STATUS

Inkhundla Code	Inkhundla Name	No. of Water Points	Functional Water Points		Partially Functional Water Points		Non Functional Water Points	
			Total No.	%	Total No.	%	Total No.	%
15	Mkhiweni	206	128	62.14	0	0	78	37.86
16	Kukhanyeni	486	371	76.34	28	5.76	87	17.90
17	Mafutseni	366	305	83.33	3	0.82	58	15.85
18	Mtfongwaneni	517	261	50.48	94	18.18	162	31.34
48	Siphofaneni	502	224	44.62	107	21.31	171	34.07
49	Mpolonjeni	123	21	17.07	5	4.07	97	78.23
50	Matsanjeni North	189	81	42.86	9	4.76	99	52.38
51	Lugongolweni	300	185	61.7	64	21.33	51	17.00
Total		2689	1576	58.6	310	11.5	803	29.9

Table 1 above shows the summary of water points functionality status of all the 8 piloted Tinkhundla. The results shows that out of 2689 water points from the 8 Tinkhundla, 1576 (58.6%) are functional water points, 310 (11.5%) are partially functional water points while 803 (29.9%) are non-functional water points. Reasons for partially functional water points and non-functional water points includes but not limited to; dry water point, pipe blocked/ burst, default payment by beneficiaries and water scheme exceeded design period. The water points that require rehabilitation are listed on table 4-A & 4B.

2.2 Summary of the Status of Homesteads on Water Points Accessibility

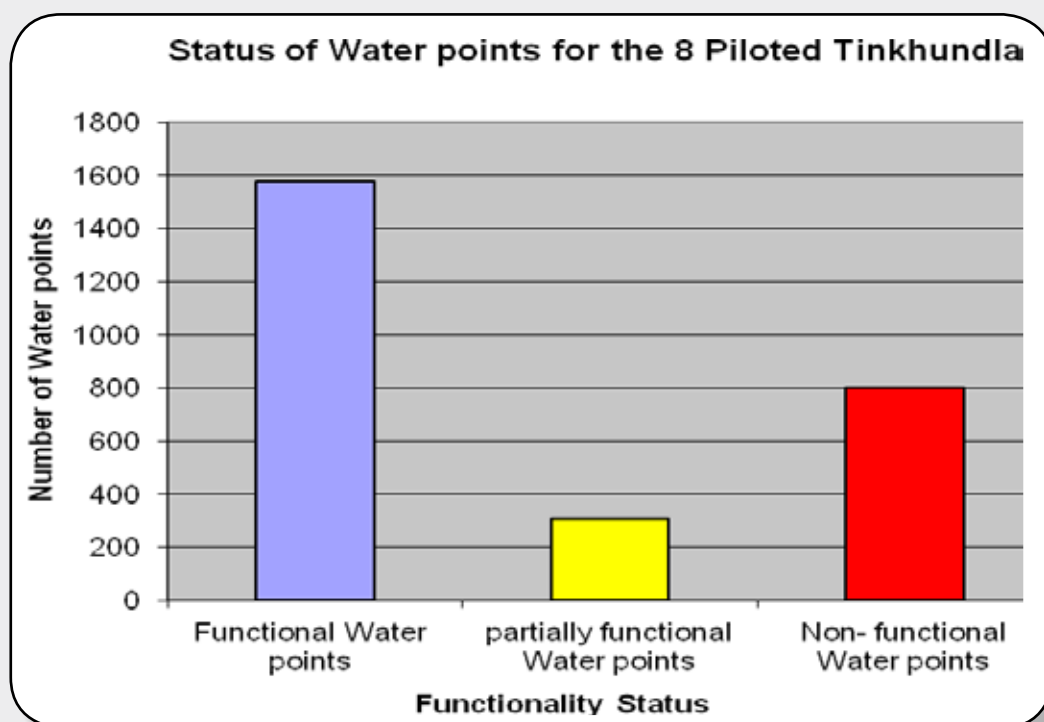
Inkhundla Code	Inkhundla Name	Total Number of Homesteads Per Inkhundla	Total Number of Homesteads with Access to Water Points		Total Number of Homesteads without Access to Water Points	
			Total No.	%	Total No.	%
15	Mkhiweni	3359	1136	33.8	2223	66.2
16	Kukhanyeni	2458	1516	61.6	942	38.3
17	Mafutseni	2290	1658	72.4	632	27.5
18	Mtfongwaneni	2582	1437	55.6	1145	44.3
48	Siphofaneni	3540	3224	91.0	316	8.9
49	Mpolonjeni	3025	1799	59.4	1226	40.5
50	Matsanjeni North	3074	2989	97.2	85	2.76
51	Lugongolweni	2521	2199	87.2	322	12.77
Total		22849	15958	69.8	6891	30.2

2.2.1 Table 2 Shows Total Number of Homesteads per Inkhundla with and Without Access to Water Points.

The table above shows that the total number of homesteads from the 8 piloted Tinkhundla is 22849. Out of the 22849 homesteads, 15958 (69.8%) homesteads have access to water points while 6891 (30.2%) have no access to water points. This is a summary of the mapped water points in the two Regions.



2.2.2 Status of Water Points in the 8 Tinkhundla



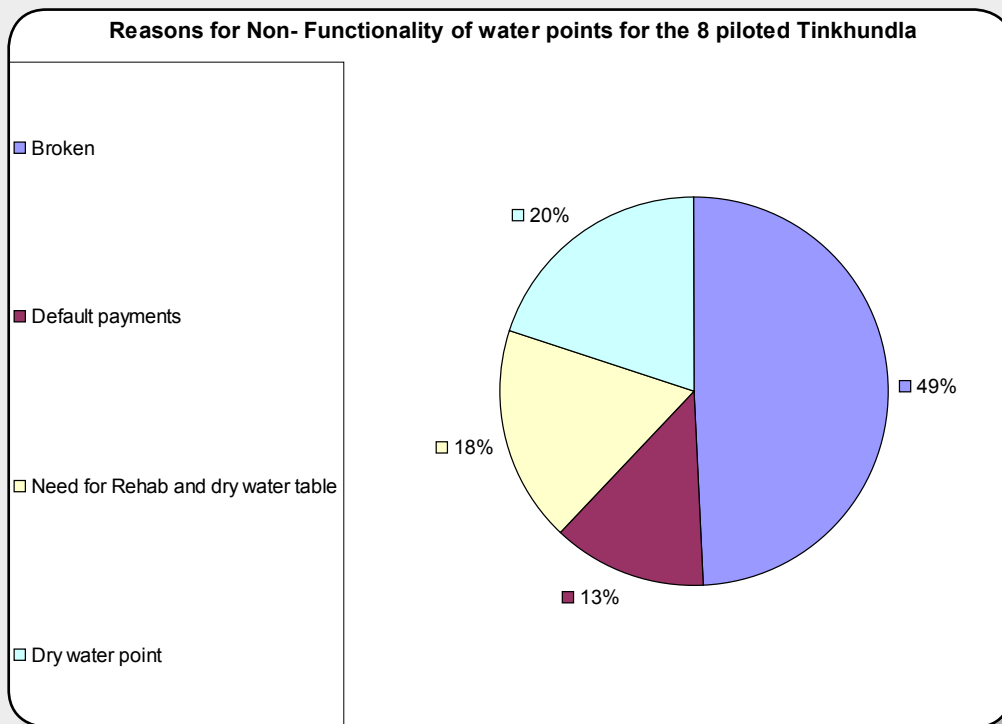
Graph 1 Summary of Findings – Status of Water Points for the 8-Piloted Tinkhundla

Table 1 and graph 1 above presents the total number of water points mapped in the 8 Tinkhundla. The table also presents total number and percentages of functional, partially functional and non-functional of water points mapped.

The table above indicates that the total number of water points mapped in the 8 Tinkhundla were 2689 and the total number of functional water points were 1576 (58.61%) and 803 (29.9%), non-functional water points while partially functional water points were 310 (11.6%) The results then indicate that there are more than 50% homesteads in the 8 piloted Tinkhundla with access to water points. However there is still need for intervention in these Tinkhundla in terms of potable water supply to achieve 100% coverage.



2.2.3 Reasons for Non- Functionality of Water Points



Pie Chart 1 above shows some of the reasons for non-functionality of mapped water points in the 8 Tinkhundla. The pie chart shows that 49% of water points were broken, 13% default payment, 18% need for rehabilitation and dry water table, 20% dry water points and 20% other reasons . However, broken systems and dry water points may also require rehabilitation. These results may be used to further investigate the total number of water points that requires rehabilitation possible draw up a rehabilitation budget.

Other reasons for nonfunctionality includes, (Burnt, blocked pipe, poor connection, abandoned, collapsed borehole, undeveloped borehole, yield too low, pump not installed, licking reservoirs, mono pump non functional, poor connections, vandalism etc).



2.3 SANITATION COVERAGE

Table 3 Summary of Findings- Sanitation Coverage by Homesteads

Inkhundla Code	Inkhundla Name	Total Number of Homesteads with access to water points per Inkhundla	Total Number of Homesteads with toilets		Total Number of Homesteads without toilets	
			Number	%	Number	%
15	Mkhiweni	1136	902	79.4	234	20.6
16	Kukhanyeni	1516	1269	83.7	247	16.3
17	Mafutseni	1658	1289	77.7	369	22.3
18	Mtfongwaneni	1437	1109	77.2	328	22.8
48	Siphofaneni	3224	2469	76.6	755	23.4
49	Mpolonjeni	1799	1192	66.3	607	33.7
50	Matsanjeni North	2989	2445	81.8	544	18.2
51	Lugongolweni	2199	1824	82.9	375	17.1
Total		15958	12499	78.3	3459	21.7

Table 2 above shows the total of 15958 homesteads mapped in the 8 piloted Tinkhundla. Among the 15958 homesteads, 12499 (78.3%) have access to toilets while 3459 (21.7%) have no access. These results prove that there is need for sanitation improvements in the piloted areas.



3. PROBLEM STATEMENT

The RWSS under the DWA is responsible for planning, design, construction, maintenance and supervision of all rural water supply and sanitation projects in the country. In addition, there are over 15 implementing partners in the rural water supply and sanitation sector in Swaziland. The Water Act of 2003 establishes the Department of Water Affairs hence the operations. The planning, design, construction, maintenance and supervision of all rural water supply schemes are guided by existing national standard water supply guidelines. These guidelines, however, are not regulations for the implementation of rural water supply projects. Owing to the absence of an instrument regulating the implementation of water supply projects in Swaziland, the country has seen many schemes constructed without the DWA having the authority or means to fully influence and monitor the chosen location for each scheme. Consequently, there has been duplication where communities which are already well served (relatively speaking) have benefited from water supply investment in Swaziland at the expense of communities with greater need. This is due to a number of reasons that include but not limited to political influence and influence from other implementing partners who have had pressure to spend budgets on fixed timelines – often reducing their ability to take time for proper planning. However, the challenges with duplication could also be attributed to the lack of collaboration and coordination in planning by the implementing agents where ‘the left hand does not know what the right hand is doing’.

According to the JICA report (2004), the number of non-functional water supply schemes constituted 42% of the total number of schemes that had been constructed in Swaziland at the time. Yet the same report did not capture the reasons that led to the non-functionality of the schemes. Despite being the custodians of this information, the DWA, has had difficulty ascertaining the total number of RWS schemes in Swaziland and being able to relate the number of these schemes to the population they serve. This difficulty has resulted in a failure to determine the number of functional and non-functional schemes. This makes it difficult for the country to monitor progress towards achieving National and International goals (i.e. PRSAP 2022 (100% coverage by 2022) and MGD No.7c (Reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015)). This situation is what led to the solicitation of support from WaterAid to put in place an intervention and a tool that would enable not only the capturing of the data but also its visualization – needed for improved decision-making.



4. OBJECTIVES

4.1 Broad Objectives

The broad objectives of the mapping tool are:

- 4.1.1 Inform sector monitoring and evaluation
- 4.1.2 Support regions' regular requirements for WASH
- 4.1.3 Input into the sector investment planning at national level to determine investment gaps and needs at community level
- 4.1.4 Inform planning and budgeting processes for new and rehabilitation of existing infrastructure
- 4.1.5 Support coordination of various players interventions in the sector
- 4.1.6 Help inform debate on standardisation of technologies and approaches

4.2 Specific Objectives

The specific objectives of this tool are:

- 4.2.1 Determine the total number of rural water supply points in the 8 Tinkhundla under review
- 4.2.2 Ascertain the population served by the existing schemes
- 4.2.3 Distinguish the number of functional, non functional, and partially functional schemes
- 4.2.4 Establish the reasons associated with the non functionality of RWSS
- 4.2.5 Produce a map for all water points in the 8 Tinkhundla
- 4.2.6 Ascertain the coverage of toilets in the communities under review

5. SIGNIFICANCE OF THE STUDY

Upon completion of the WPM exercise, the GoS should be able to facilitate coordinated planning and implementation of RWS schemes thereby achieving the equitable distribution of national resources. The mapping will also enable the GoS to monitor progress towards MDGs and national targets for water and sanitation. In addition, this tool will also inform investment plans for water supply and sanitation services in the country. Monitoring and continuous evaluation will bring about new strategies that will improve the design, implementation, and Operations and Maintenance of RWS schemes in the country.



6. METHODOLOGY

A month had been initially allocated to map all the water supply schemes in the 8 Tinkhundla under review. However, the pilot exercise eventually lasted 7 weeks. Both the financial resources available influenced the period for the pilot as well as the availability of the officers who would be involved in the mapping exercise.

Two teams of officials from both the GoS and WASH partners were formed with one team that concentrated in the Manzini region and the other in the Lubombo region. The operations of the teams ran concurrently as a means to manage the time limits that had been set to complete the exercise. There were 24 officers involved in the exercise with 12 people per region.

6.1 Developing and Testing

The WaterAid technical team in UK developed the water point-mapping tool that included the structured questionnaire. The water point-mapping tool was developed based on the variables developed by the DWA that suited the Swaziland context. The Swaziland mapping team with the assistance from WaterAid and Engineers Without Borders- Canada technical team tested the structured questionnaire and it lasted for a week. The testing of the structured questionnaire included collecting the data from the water points. The structured questionnaire was used to record the main characteristics, such as location, functionality, category of water supply, water quality perception, management issues, ownership and water tariff payment. The first team to test the tool was the Manzini Region and the Lubombo Region followed. Two days were allocated for each region.

6.2 Data Collection

The transport used to collect data was in the form of motor vehicles from both the GoS and the WASH partners. On average 2 cars were available to each team per week. The data was collected with assistance from the local water supply scheme committee members. At least one local water committee member was available to the team for the duration of the mapping for each scheme. All water points for the scheme were mapped and there could be up to 169 points for a single water scheme. The teams discovered some schemes with far larger than expected numbers of points as many house connections had been made illegally to the initial communal standpipes that had been installed.

GPS devices were used to collect the coordinates from each water point and record the data in the structured questionnaire. The Surveyor General provided the GPS devices and each team had 3 GPS devices. A team of 3 people formed a team that shared 1 GPS device, with 1 person taking GPS coordinates and another recording the data. The third member acted as a driver for the team.

6.3 Data Input

Two (2) members in each region remained in the hotel each day to input the data from the previous day of data collection. The 2 were necessary to expedite the process with one reading from the data sheet and the other inputting the data using the computer. There was 1 laptop for each region that was used to input the data. These were personal laptops from team members.



6.4 Data Analysis

The analysis of the data was done by a task team of 8 members in 9 days. The data quality was very poor which led to a large period of time required to analyze the data. The data was analyzed using Statistical Package for Social Sciences, Microsoft Excel (using the WaterAid Spreadsheet Mapper), and Google Earth.

6.5 Report Writing

The Task Team members consolidated the report and it lasted for 9 days with the assistance of WaterAid's technical advisors. The first draft was circulated to the field team members for comments and the second was shared with the Director for DWA, CSO, SG, Wash Forum Members and the WaterAid and Engineers Without Borders Canada technical team for comments. Subsequent to incorporation of the comments from the latter team, the final report was compiled and presented to the Minister for MNRE and the WaterAid Head of Region in Malawi

6.6 Sources of Resources Used

6.6.1 Finances

Financial support for this project was availed by the WaterAid and its cooperating partners, which catered for accommodation, meals, fuel, per-diems, venues, stationery, photocopying, communication, internet etc.

6.6.2 Technical Support and Human Resources

WaterAid, Engineers Without Borders- Canada, the Government of Swaziland, and its cooperating partners particularly the Central Statistics Office and Surveyor General Department supported the project. The team was comprised of the GoS employees and representatives from the WASH partners.

6.6.3 Transport and Fuel

The transport used for this project was in the form of motor vehicles provided by the GoS and the WASH partners and WaterAid provided the funds for fuel.



7. SAMPLING METHODOLOGY

7.1 Sample Method

The study selected Manzini and Lubombo Regions and within the 2 regions 4 Tinkhundla per region were selected for the pilot exercise. The Tinkhundla sampled for the pilot exercise were influenced by convenience than any other rationale that could be thought of.

7.2 Sample Size

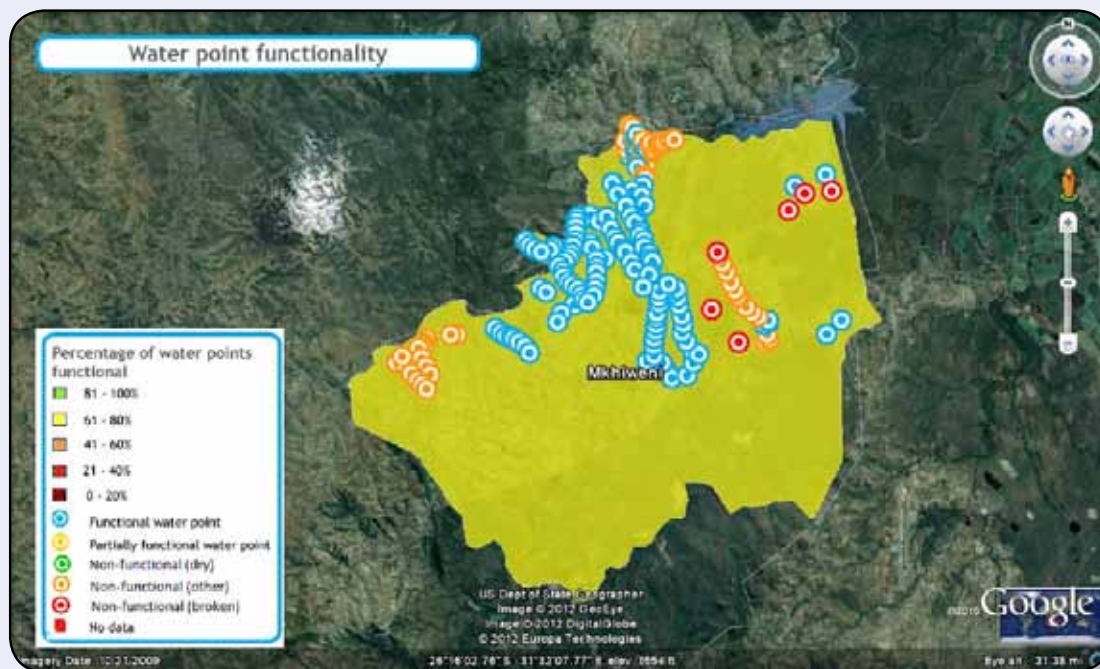
For the purpose of this pilot project, 2 Regions out of 4 were selected, that is Manzini and Lubombo Regions. In Manzini Region 4 Tinkhundla were selected out of 16 and in Lubombo Region 4 Tinkhundla were selected out of 11. The Kingdom of Swaziland has 55 Tinkhundla centres in total – therefore the project covered 14.5% of the Tinkhundla in the country. All existing water supply schemes within the various communities under the selected Tinkhundla were mapped whether functional, non-functional, partially functional, or under construction.



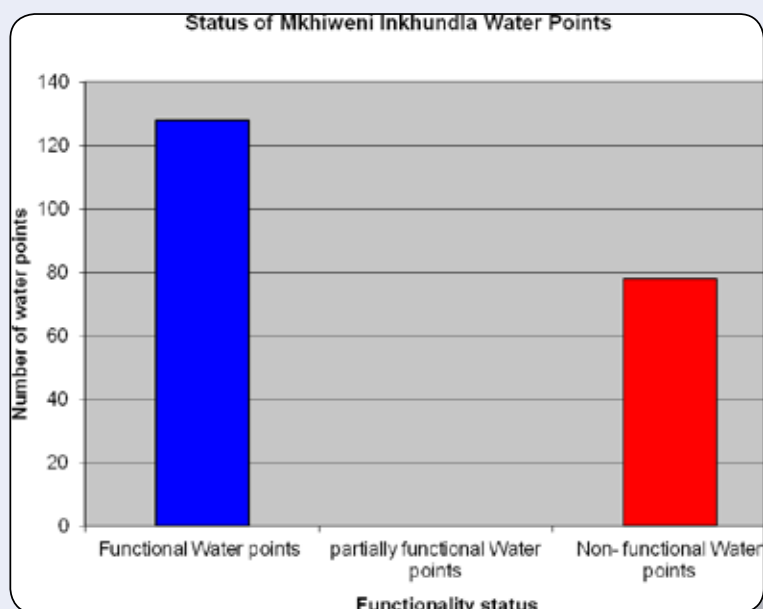
8. STATEMENT OF FINDINGS

This section presents results of findings for each Inkhundla and the results are presented in maps, graphs, pie charts, and tables. The background colour of the maps indicates the percentage of water points functionality as shown on the legend below while the different coloured dots on the map indicates the functionality status and distribution of the water points.

8.1 Mkhiweni Inkhundla



Map 2 Showing Mkhiweni Inkhundla Water Point Functionality and Distribution

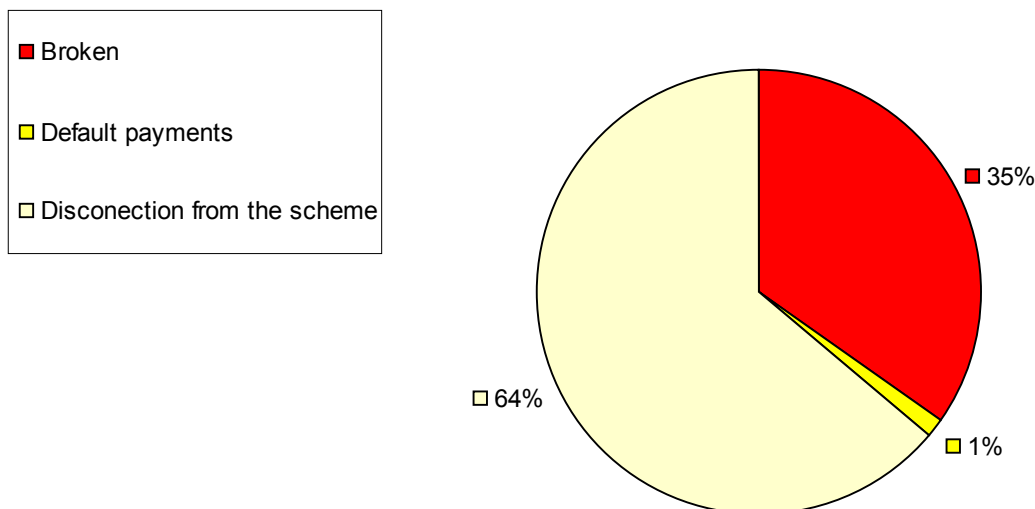


Graph 2 Presents Summary of Findings – Status of Mkhiweni Inkhundla Water Points

Graph 2 above shows the number of functional, partially functional and non-functional water points at Mkhiweni Inkhundla. The graph indicates that the total number of functional water points is 128 (62.14%) while 78 (37.86%) water points were non-functional. The list of non-functional water points that requires rehabilitation in the Mkhiweni Inkhundla are listed in Table 4-A and 4-B below.



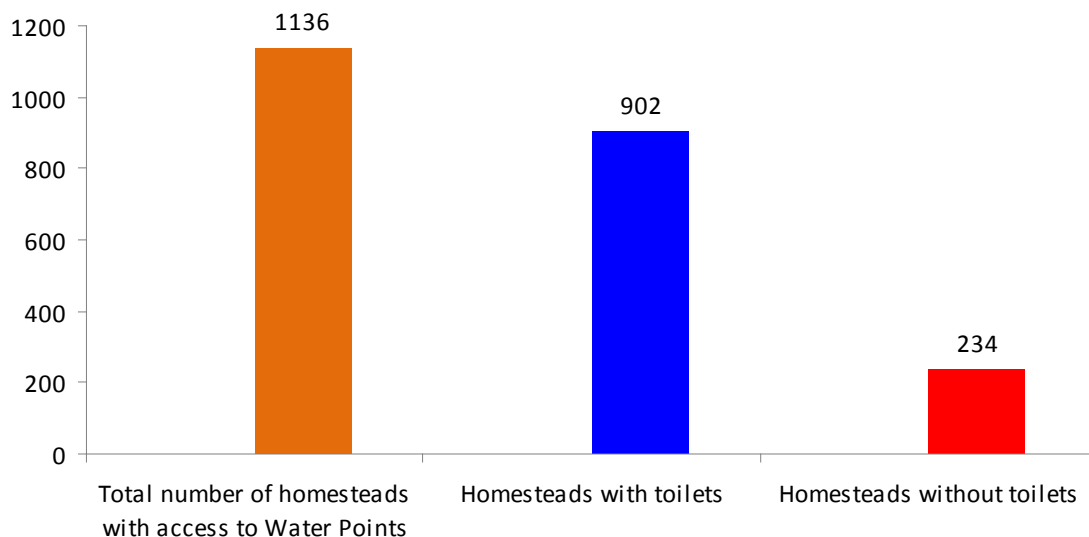
Reason for Non- Functionlity Water Points at Mkhiweni Inkhundla



Pie Chart 2 Reasons for Non-Functionality of Mkhiweni Inkhundla Water Points

The pie chart 2 above shows the reasons for non-functionality of water points at Mkhiweni Inkhundla. The pie chart depicts that 35 % of the water points were broken, 1% default payment of electricity and 64% was disconnection from the scheme. The findings of this mapping exercise under this constituency shows that 35 % of the water points are broken and those broken are listed in Table 4-A and Table 4-B.

Mkhiweni Inkhundla Sanitation Coverage by Homesteads

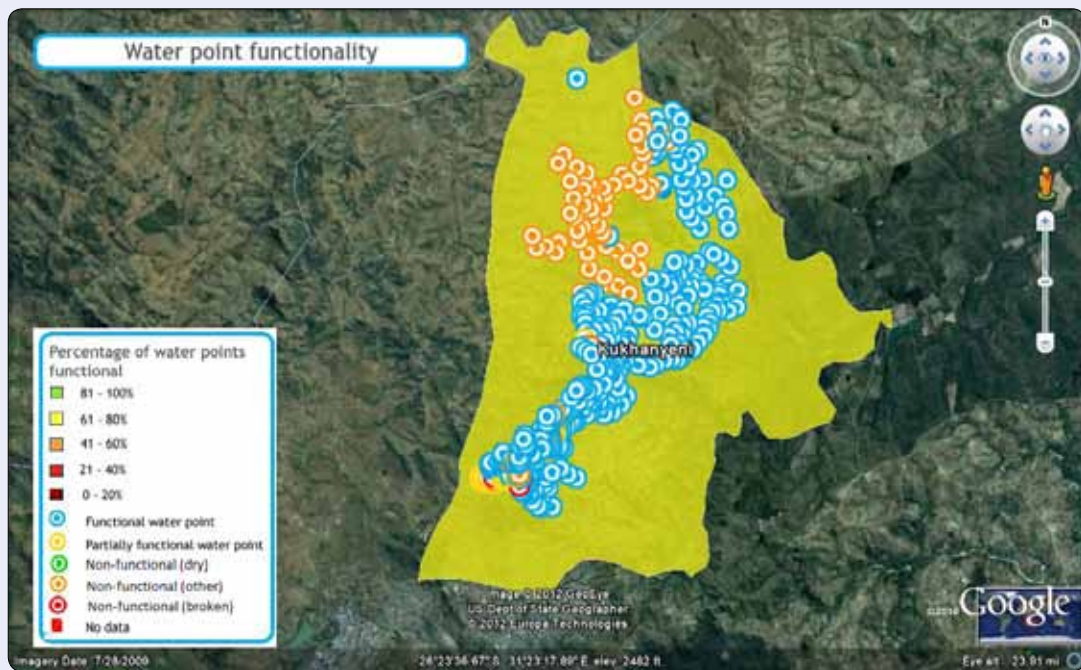


Graph 3 Presents Mkhiweni Inkhundla Sanitation Coverage by homesteads

Graph 3 above shows the total number of homesteads at Mkhiweni Inkhundla with access to water points and number of homesteads with toilets and number of homesteads without toilets. The data show that there are still homesteads without toilets at Mkhiweni Inkhundla out of those sampled during this exercise.



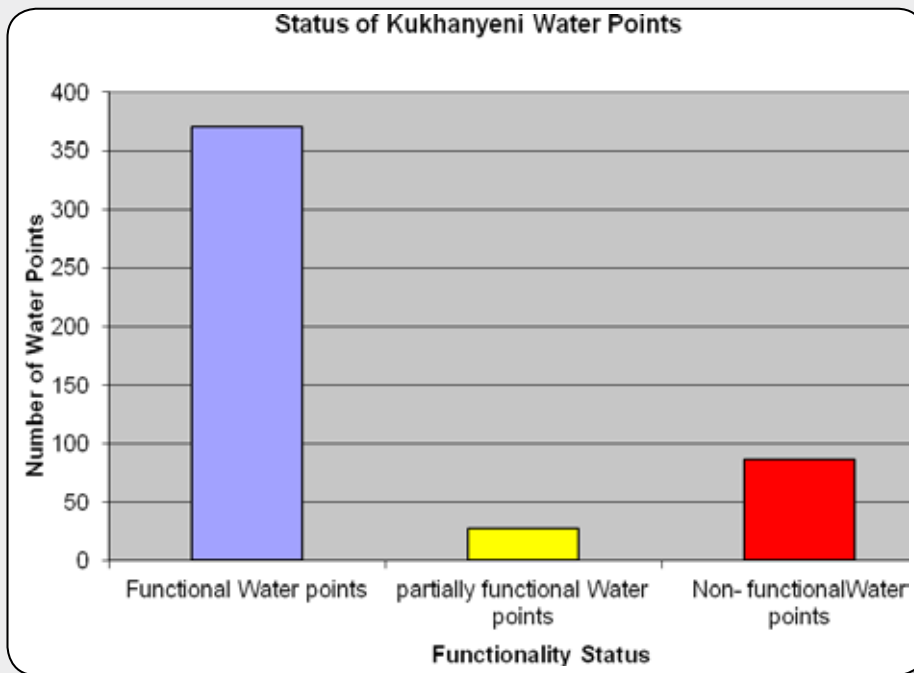
8.2 Kukhanyeni Inkhundla



Map 3 Showing Kukhanyeni Inkhundla Water Point Functionality and Distribution

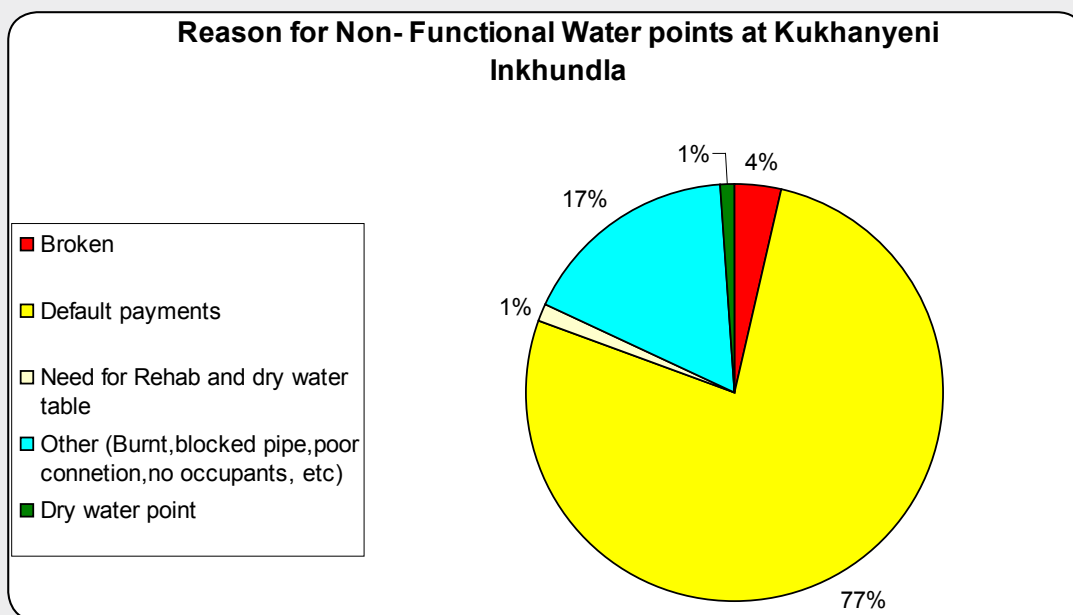
The background colour of the map indicates the percentage of water points functionality under Kukhanyeni Inkhundla while the dots indicates the number of water points and its functionality status. The map above shows that the functionality of water points at Kukhanyeni Inkhundla ranges between 61% - 80% (background Colour). It also depicts that majority of the water points (blue dots) are functional with very few that are partially functional (orange dots) and non-functional (red dots). A detail of the functionality of the water points is outlined in the graph below.





Graph 4 Presents Summary of Findings – Status of Kukhanyeni Inkhundla Water Points

Graph 4 above indicates the number of functional, partially functional and non-functional water points at Kukhanyeni Inkhundla. The graph shows that the total number of functional water points is 371 (76.34%), total number of partially functional water points is 28 (5.76%) and 87 water points were non-functional (17.9%).

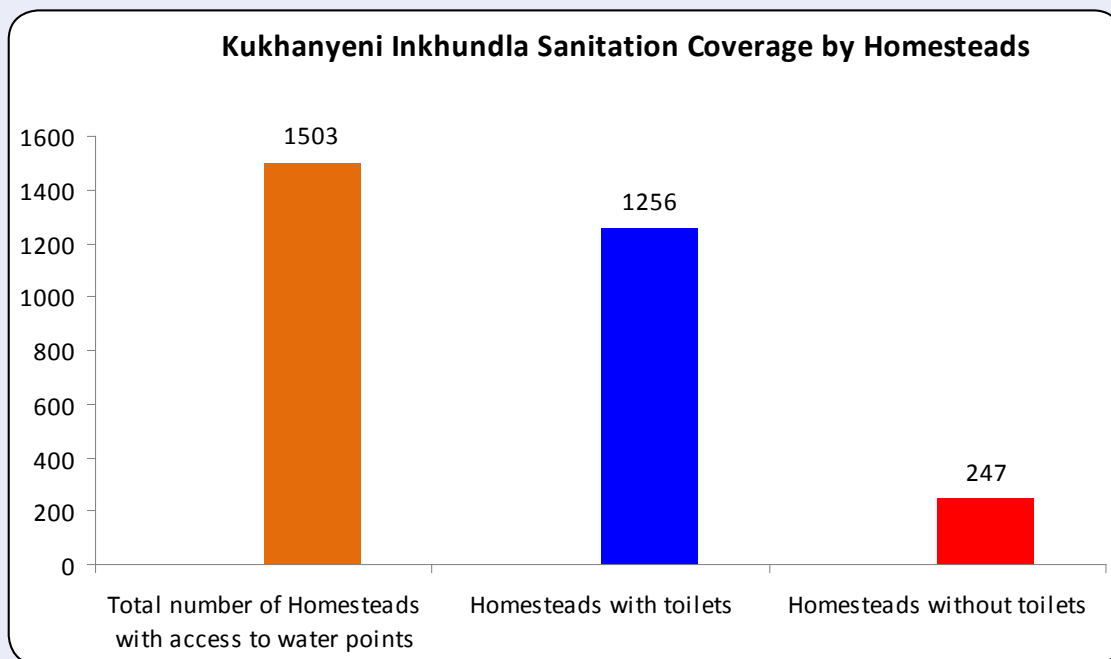


Pie Chart 3 Reasons for Non-Functionality of Kukhanyeni Inkhundla Water Points

The pie chart 3 above shows the reasons for non-functionality of water points at Kukhanyeni Inkhundla. The pie chart depicts that 4% of the water points were broken, 77% default payments (Electricity), 1% need rehabilitation and dry water table, 1% for dry water point and 17% for other reasons. Mkhulamini water scheme is one of the reticulated schemes under this constituency that requires rehabilitation as this project had exceeded its design period and this was determined by the findings of mapping exercise. Two hand pumps under Mbuluzana community also require full rehabilitation. Detailed list of water points that requires rehabilitation under this Inkhundla are listed on Table 4A and Table 4 B below.

Default Payment means that the community fails to pay electricity bill and the water point has been disconnected.



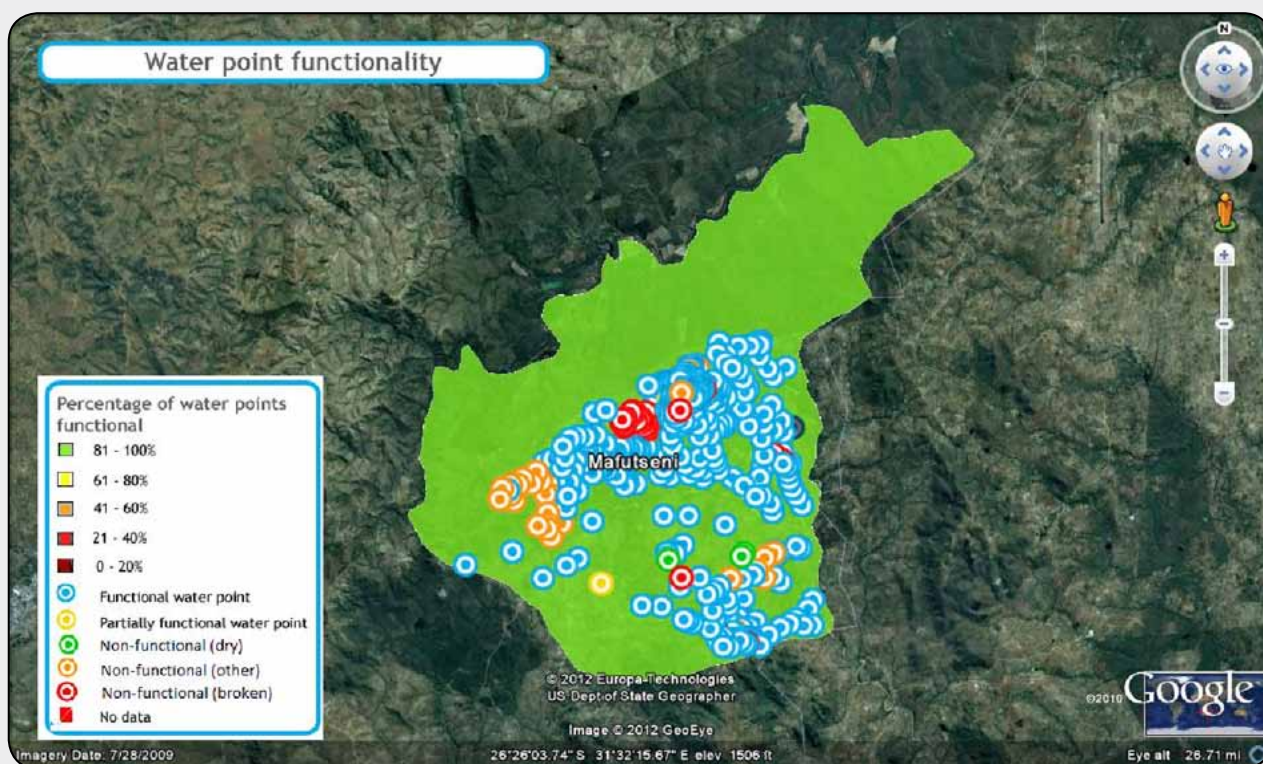


Graph 5 Presents Kukhanyeni Inkhundla Sanitation Coverage by homesteads

Graph 5 above shows the total number of homesteads at Kukhanyeni Inkhundla with access to water points and out of 1503 total homesteads sampled, 1256 had toilets while 247 had no toilets. The data show that there are still homesteads without toilets at Khukhanyeni Inkhundla out of those sampled during this exercise.



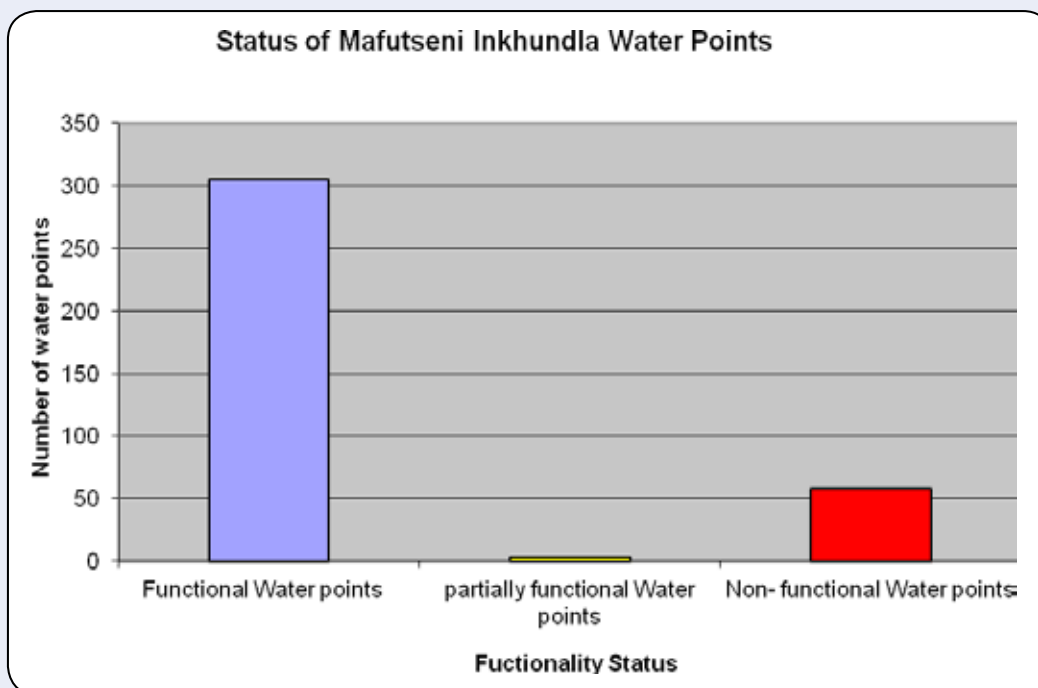
8.3 Mafutseni Inkhundla



Map 4 Showing Mafutseni Inkhundla Water Point Functionality and Distribution

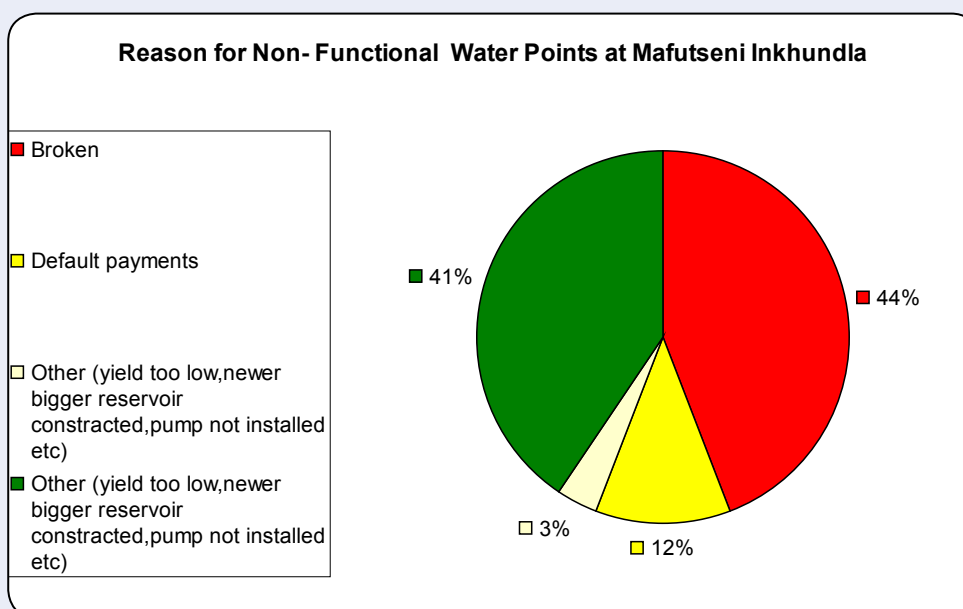
The background colour of the map above depicts the percentage of water point's functionality while the coloured dots indicates the distribution and functionality status of the water points in this Inkhundla. The green colour indicates that the functional water points under this Inkhundla ranges from 81 - 100%. The dots also depict that majority of the water points (blue dots) are functional with very few that are partially functional (orange dots) and non-functional (red dots). The detailed list of the non-functional water points that requires rehabilitation are listed on Table 4A and Table 4B while a detail of the functionality status of the water points is outlined in the graph below.





Graph 6 Presents Summary of Findings –Status of Mafutseni Inkhundla Water Points

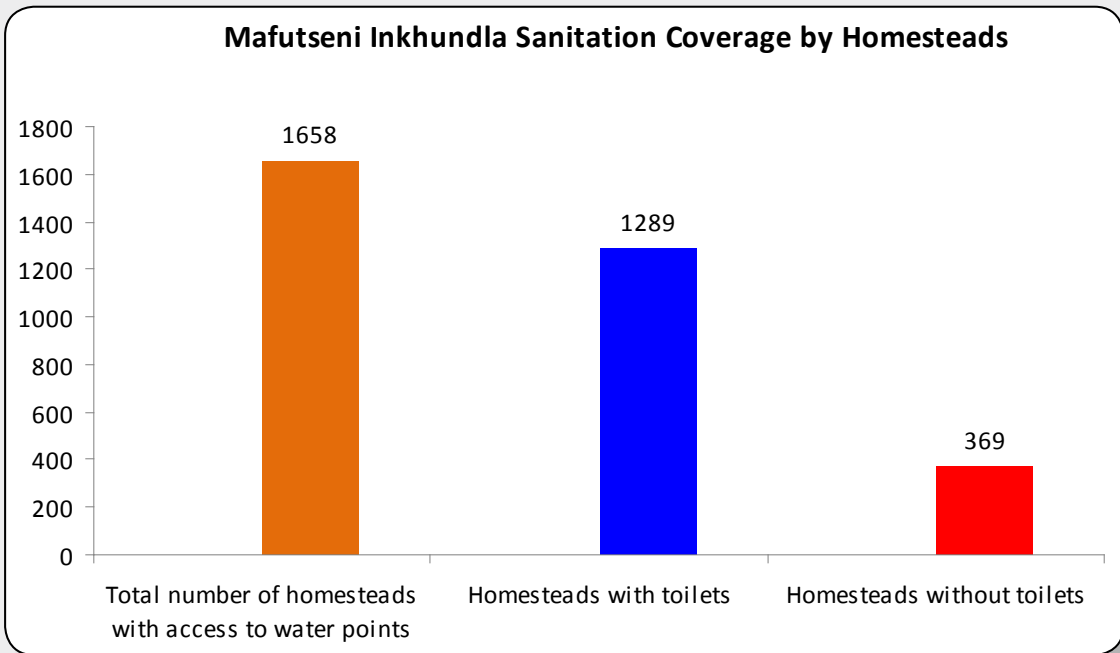
Graph 6 above shows the number of functional, partially functional and non-functional water points at Mafutseni Inkhundla. The graph shows that the total number of functional water points is 305 (83.33%), total number of partially functional water points is 3 (0.82%) and 58 water points were non-functional (15.85%).



Pie Chart 4 Reasons for Non-Functionality of Mafutseni Inkhundla Water Points

The pie chart 4 above shows the reasons for non-functionality of water points at Mafutseni Inkhundla. The pie chart depicts that 44% of the water points were broken, 12% default payments, 3% need rehabilitation and dry water table and 41% for leaking reservoirs and other reasons. Through the findings of this mapping exercise under this Inkhundla 44% of the water points need rehabilitation and are listed on Table 4 A and B.



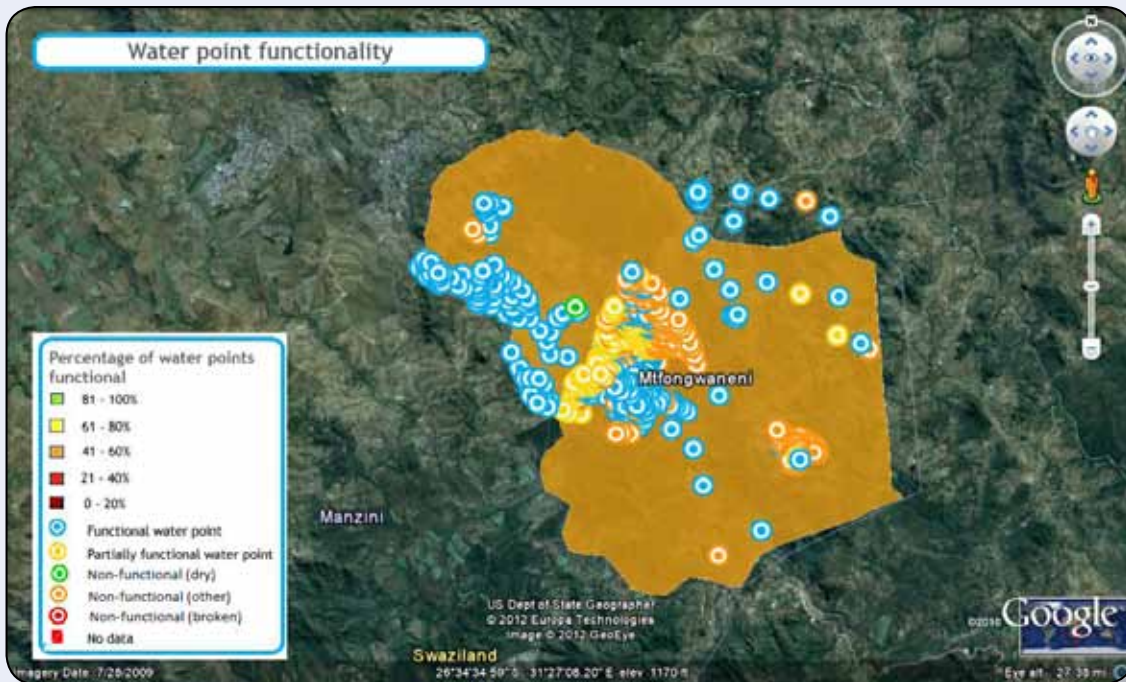


Graph 7 Presents Mafutseni Inkhundla Sanitation Coverage by homesteads

Graph 7 above shows that out of 1658 sampled homesteads, 1289 has toilets while 369 are without toilets. The results shows that there are homesteads with access to potable water but without an access to toilets. There is need for intervention to ensure that all the homesteads have access to toilets and proper sanitation facilities.



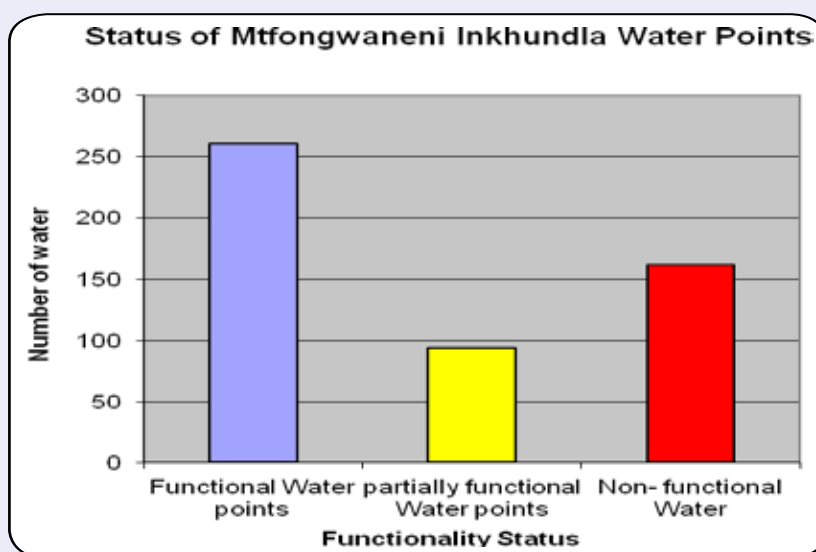
8.4 Mtfongwaneni Inkhundla



Map 5 Showing Mtfongwaneni Inkhundla Water Point Functionality and Distribution

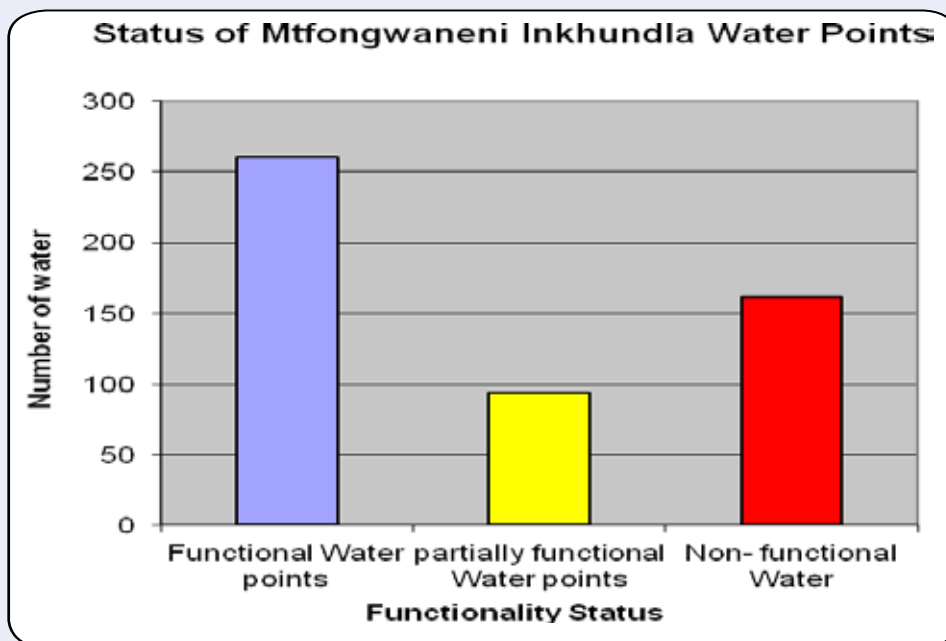
The background colour of the map shows the percentage of the functionality of the existing water points in the Inkhundla while the coloured dots indicates the distribution of the water points and its functionality status. The background colour of this Inkhundla indicates that the percentage of functional water points for this Inkhundla ranges between 41 - 60%. It also depicts that majority of the water points (blue dots) are functional with very some that are non-functional and partially functional. Although the map does not show where the residents are located, but the percentage of the functionality of the existing water points is too low as it is below 50%. This means that the population without access to potable water is very high.

A detail of the functionality of the water points is outlined in the graph below.



Graph 8 Presents Summary of Findings –Status of Mtfongwaneni Inkhundla Water Points

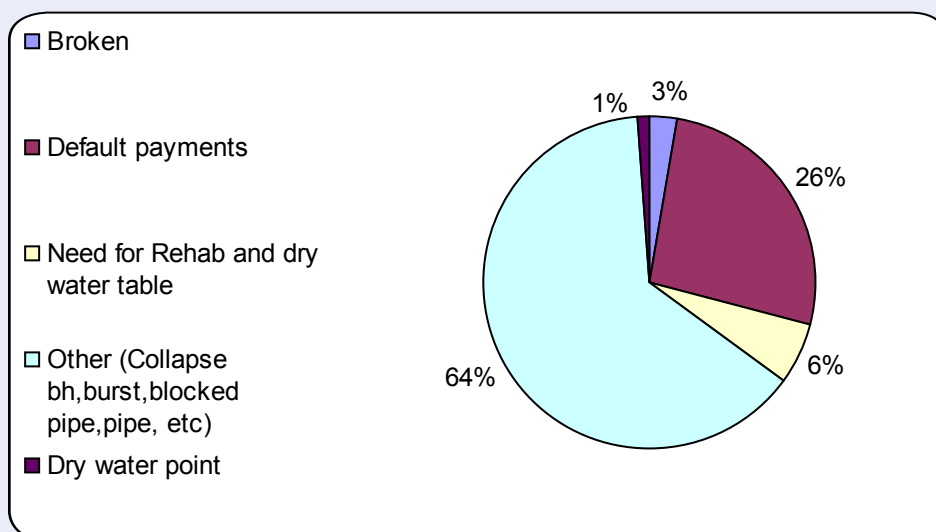




Graph 8 Presents Summary of Findings –Status of Mtfongwaneni Inkhundla Water Points

Graph 8 above shows the number of functional, partially functional and non-functional water points at Mtfongwaneni Inkhundla. The graph shows that the total number of functional water points is 261 (50.48%), total number of partially functional water points is 94 (18.18%) and 162 water points were non-functional (31.34%). Partially functional water points means that the water point does not serve the intended population in full. It may be rationed or sometimes dry etc.

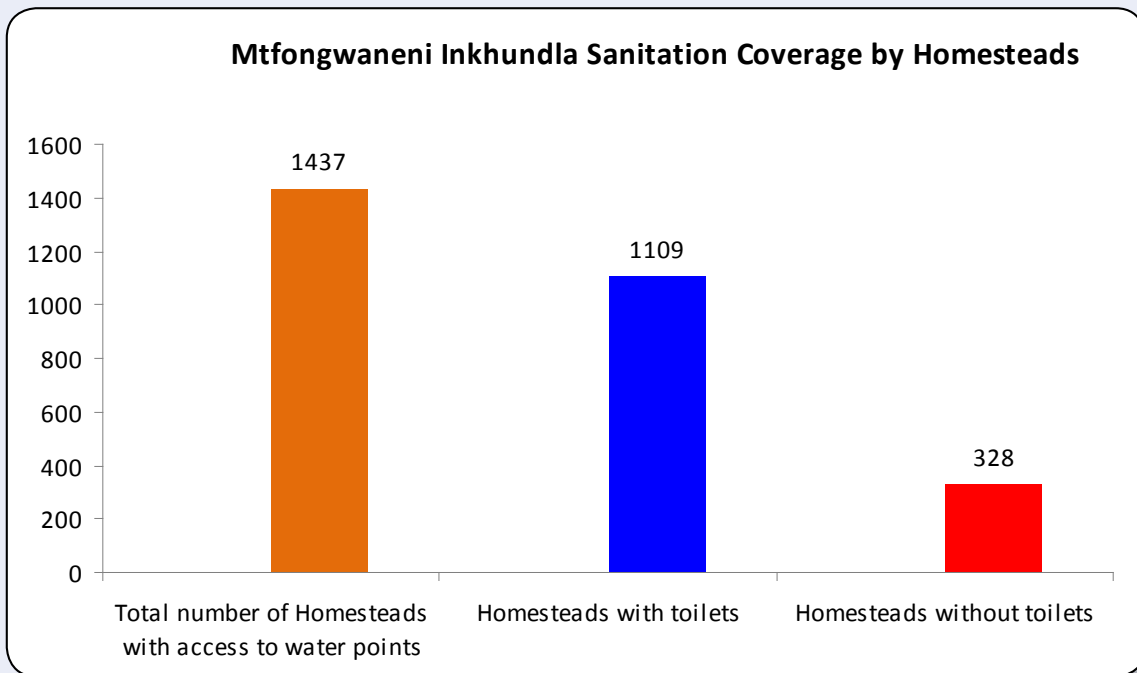
Reasons for Non-Functionality of Mtfongwaneni Inkhundla Water Points



Pie Chart 5 Reasons for Non-Functionality of Mtfongwaneni Inkhundla Water Points

The pie chart 5 above shows the reasons for non-functionality of water points at Mtfongwaneni Inkhundla. The pie chart depicts that 3% of the water points were broken, 26% default payments, 6% need rehabilitation and dry water table, 1% for dry water point and 64% for other reasons. Through the findings of this mapping exercise under this constituency, 6% of the water points need rehabilitation and below is the list of the water scheme that require rehabilitation. The results shows that there is only 6% that needs rehabilitation, however even the 64% other may also need rehabilitation. A further study that will inform the necessary action to be taken on the default water points may be conducted.



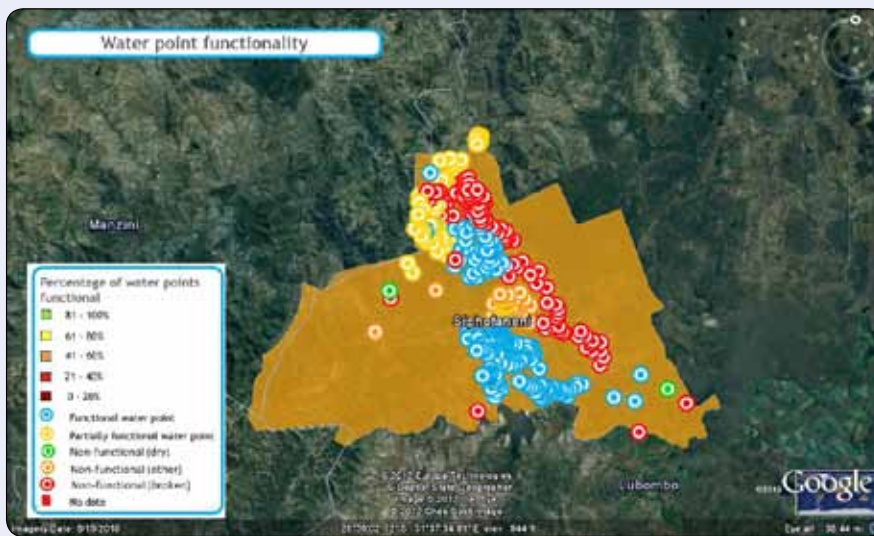


Graph 9 Presents Mtfongwaneni Inkhundla Sanitation Coverage by homesteads

Graph 9 above shows the total number of homesteads at Mtfongwaneni Inkhundla with access to water points and number of homesteads with toilets and number of homesteads without toilets. Out of the 1437 homesteads, only 1109 has toilets and 328 has no toilets. A further intervention is required in this Inkhundla to ensure all homesteads have proper sanitation facilities.

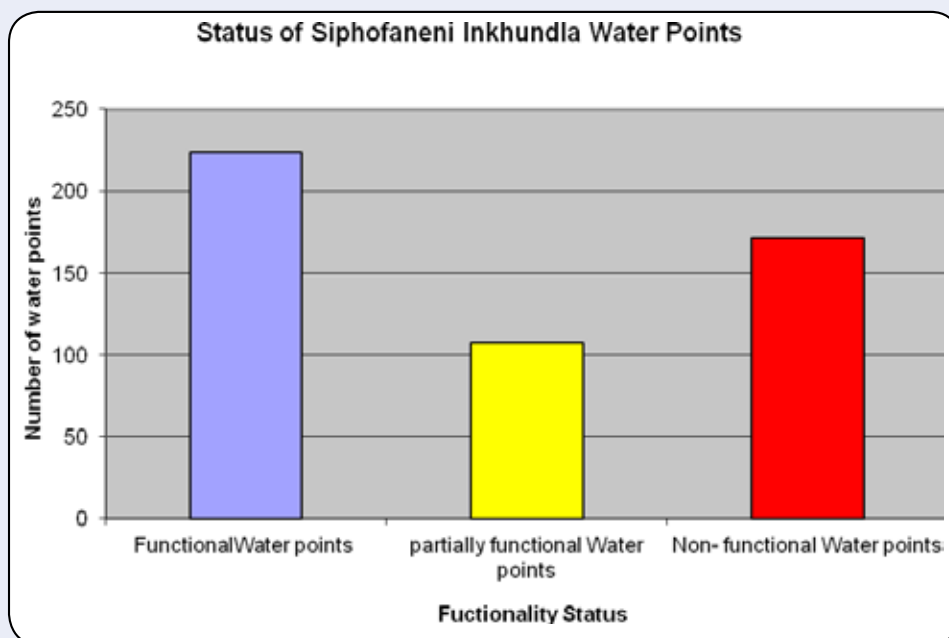


8.5 Siphofaneni Inkhundla



Map 6 Showing Siphofaneni Inkhundla Water Point Functionality and Distribution

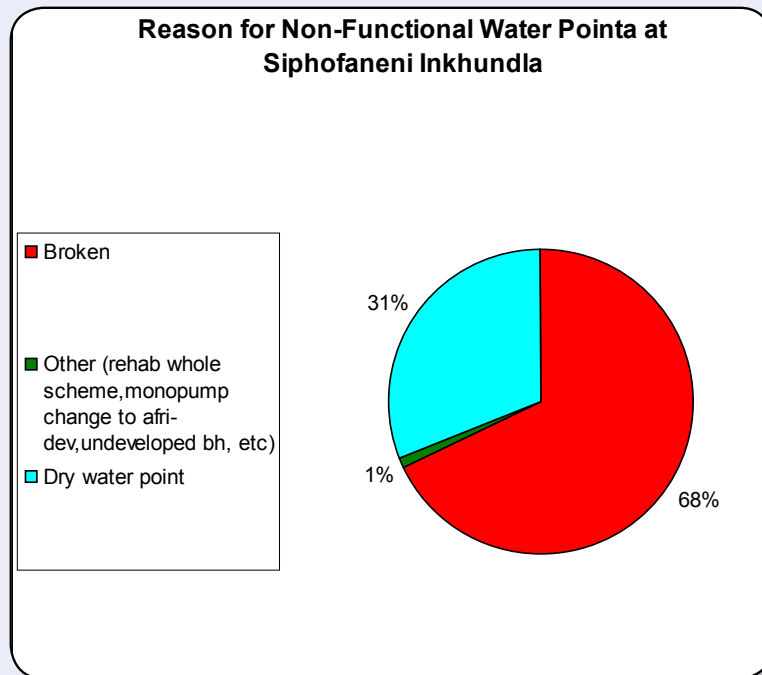
The background colour of the map shows the percentage of the functionality of the existing water points in the Inkhundla while the coloured dots indicates the distribution of the water points and its functionality status. It indicates that the functional water points at Siphofaneni Inkhundla ranges between 41%-60%. It also depicts that there is a representation of all the functionality status of the water points as outlined in the legend above. Although the map does not show the exact location of the residents, but the percentage of the functionality of the existing water points is too low as it is below 50% and scattered in the middle of the Inkhundla. This means that the population without access to potable water is very high. However, a further study that will show the location of the residents may be conducted in future. A detail of the functionality of the water points is outlined in the graph below.



Graph 10 Presents Summary of Findings –Status of the Siphofaneni Inkhundla Water points.

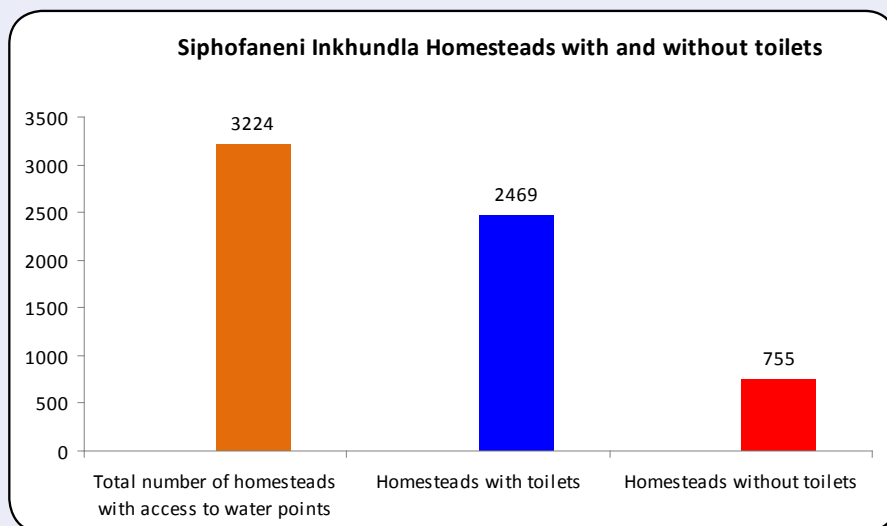
Graph10 above shows the number of functional, partially functional and non-functional water points at Siphofaneni Inkhundla. The graph shows that the total number of functional water points is 224 (44.62%), total number of partially functional water points is 107 (21.31%) and 171 water points were non-functional (34.07%).





Pie Chart 6 Reasons for Non-Functionality of Siphofaneni Inkhundla Water Points Distribution

The pie chart 6 above shows the reasons for non-functionality of water points at Siphofaneni Inkhundla. The pie chart depicts that 68% of the water points were broken, 1% for dry water points and 31% illegal connection and other reasons. The results of this mapping exercise shows that 68% of the water points are broken and three (3) of these water points are macro schemes while (2) two of those schemes are micro schemes. The illegal connections lead to non-availability of water in other water points. The results show that only 68% of the non-functional schemes require rehabilitation; however a further study may be conducted to inform the required action on the other non-functional water points.

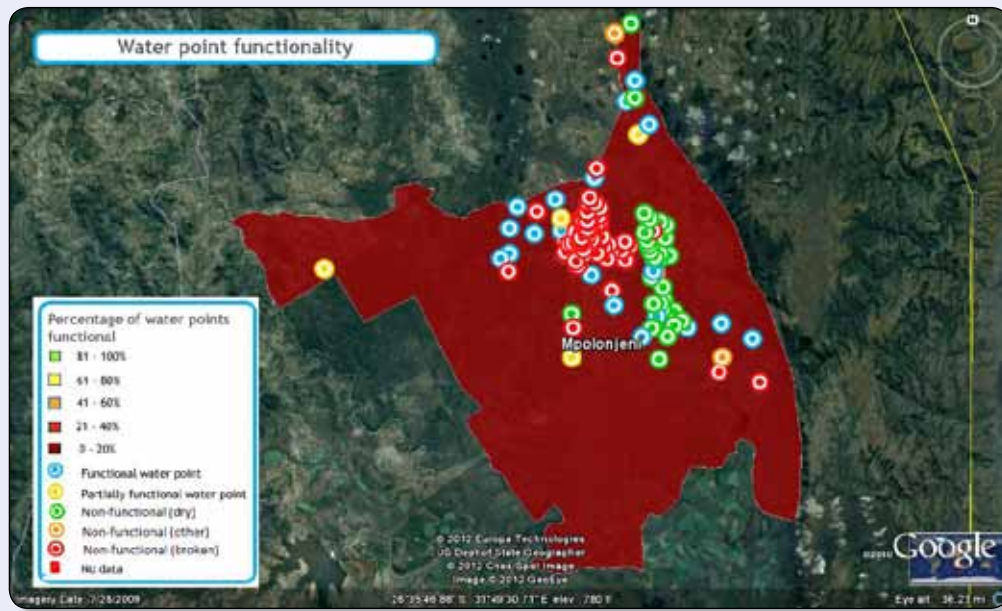


Graph 11 Presents Siphofaneni Inkhundla Sanitation Coverage by homesteadsPointsDistribution

Graph 11 above shows the total number of homesteads at Siphofaneni Inkhundla with access to water points and number of homesteads with toilets and number of homesteads without toilets. Out of a total of 3224 homesteads at Siphofaneni Inkhundla, 2469 homesteads has toilets while 755 homesteads are without toilets and proper sanitation facilities



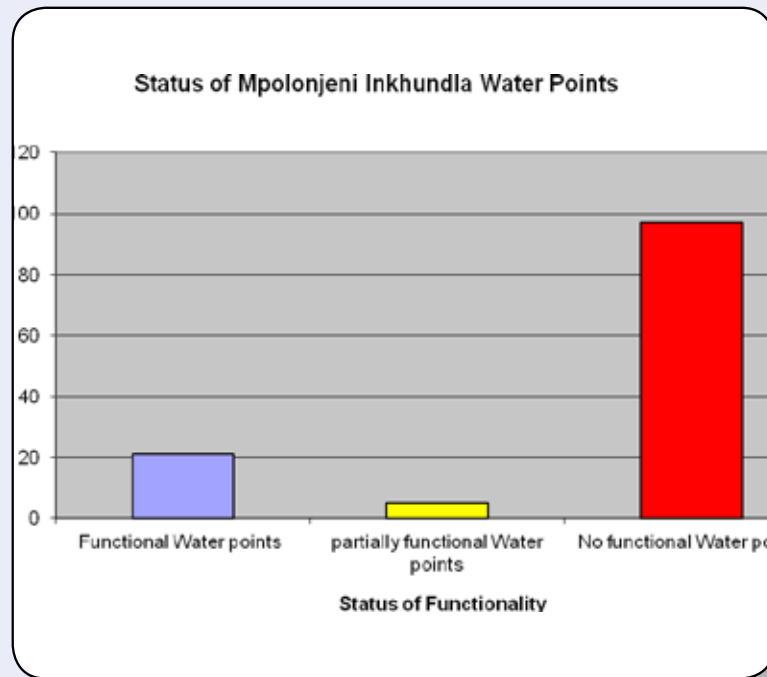
8.6 Mpolonjeni Inkhundla



Map 7 Showing Mpolonjeni Inkhundla Water Point Functionality and Distribution

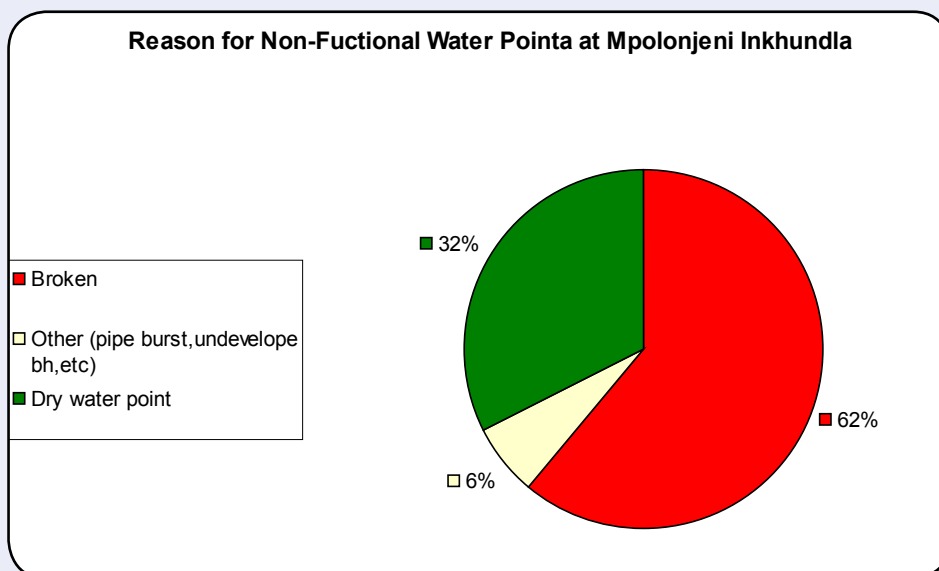
The background colour of the map shows the percentage of the functionality of the existing water points in the Inkhundla while the coloured dots indicates the distribution of the water points and its functionality status. It shows that the functionality of water points at Mpolonjeni Inkhundla ranges between 0% - 20%. It also depicts that there is a representation of all the functionality status of the water points as outlined in the legend above with the majority of non-functional water points. Although the map does not show the exact location of the residents, but the percentage of the functionality of the existing water points is too low as it is below 50% and scattered in the middle of the Inkhundla. This means that the population without access to potable water is very high. However, a further study that will show the location of the residents may be conducted in future and further study on rehabilitation of the water points. A detailed graph of the functionality of the water points is outlined below.





Graph 12 Presents Summary of Findings –Status of Mpolonjeni Inkhundla Water Points

Graph12 above shows the number of functional, partially functional and non-functional water points at Mpolonjeni Inkhundla. The graph shows that the total number of functional water points is 21 (17.07%), total number of partially functional water points is 5 (4.07%) and 97 water points were non-functional (78.23%).

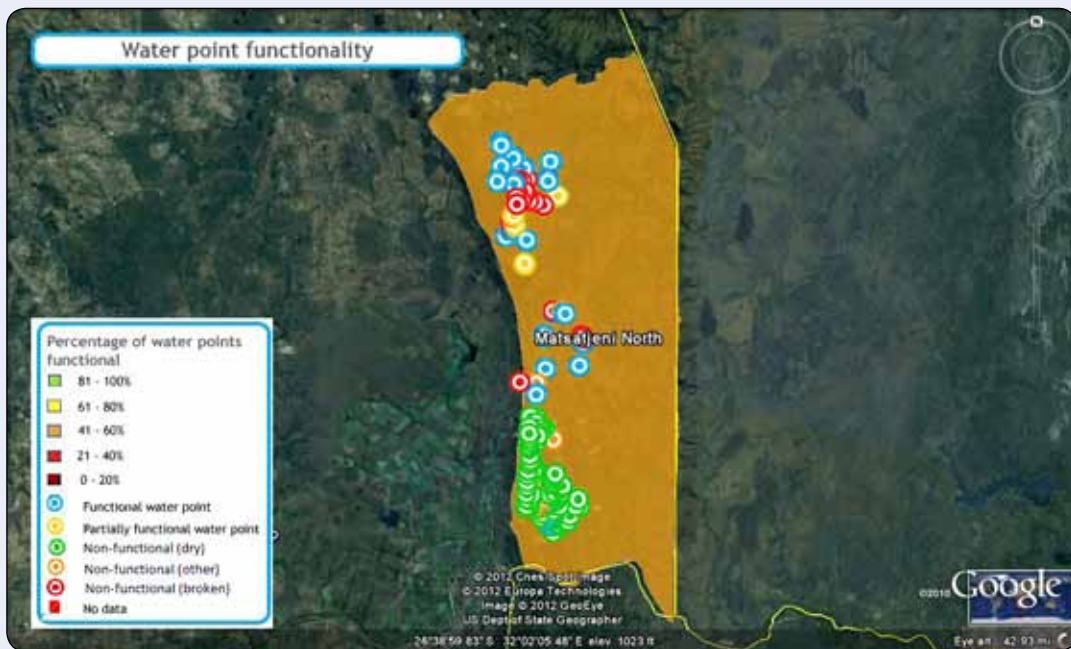


Pie Chart 7 Reasons for Non-Functionality of Mpolonjeni Inkhundla Water Points

The pie chart 7 above shows the reasons for non-functionality of water points at Mpolonjeni Inkhundla. The pie chart depicts that 61% of the water points were broken, 33% for dry water points and 6% for pipe burst and other reasons. According to the findings of this mapping exercise that 61% of the water points are broken and three (3) of these water points are macro schemes while (3) of those schemes are micro schemes shown on table 4-B.

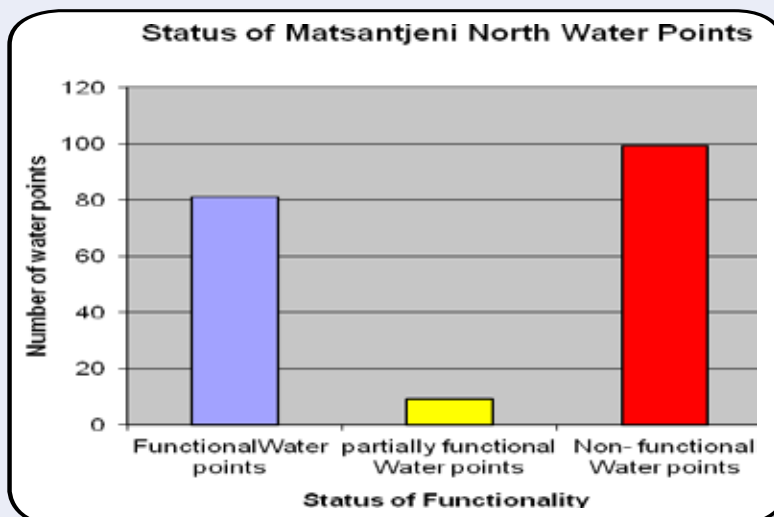


8.7 Matsanjeni North



Showing Matsanjeni North Inkhundla Water Point Functionality and Coverage

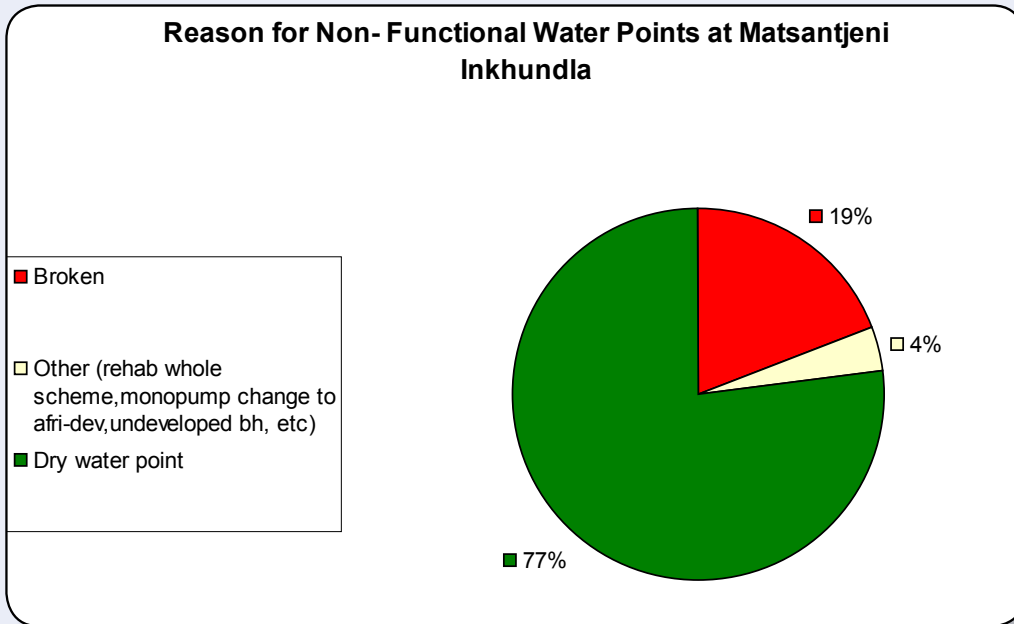
The background colour of the map shows the percentage of the functionality of the existing water points in the Inkhundla while the coloured dots indicates the distribution of the water points and its functionality status. It shows that the functionality of water points at Mpolonjeni Inkhundla ranges between 41% - 60%. It also depicts that there is a representation of all the functionality status of the water points as outlined in the legend above with the majority of functional water points. Although the map does not show the exact location of the residents, but the percentage of the functionality of the existing water points is too low as it is below 50% and scattered on the western side of the Inkhundla. This means that the population without access to potable water is very high. However, a further study that will show the location of the residents may be conducted in future and further study on rehabilitation of the water points. A detailed graph of the functionality of the water points is outlined below.



Graph 14 Presents Summary of Findings – Status of Matsanjeni Inkhundla Water Points.

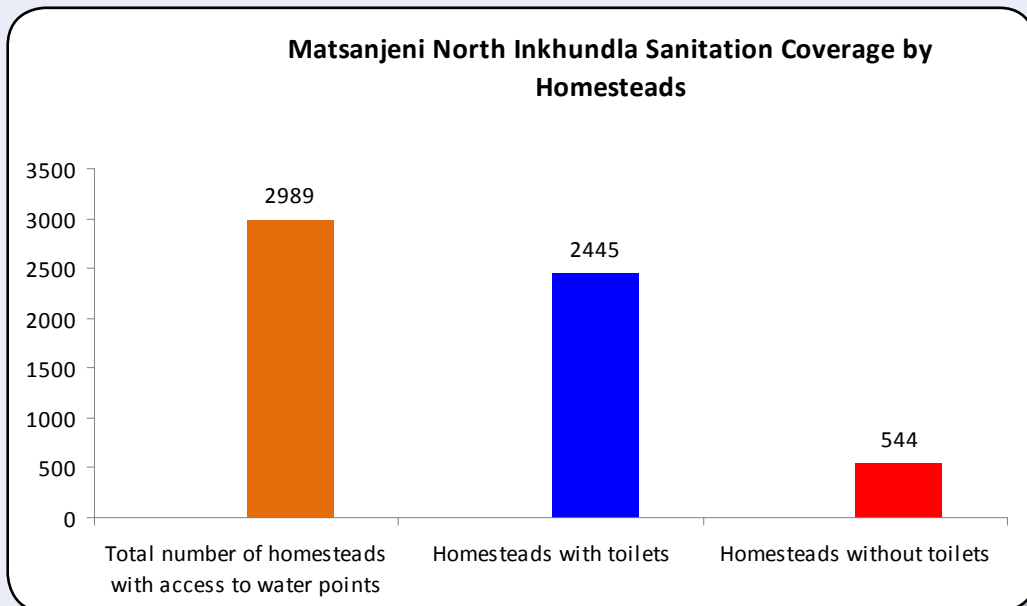
Graph14 above shows the number of functional, partially functional and non-functional water points at Matsanjeni North Inkhundla. The graph shows that the total number of functional water points is 81 (42.86%), total number of partially functional water points is 9 (4.76%) and 99 water points were non-functional (52.38%).





Pie Chart 8 Reasons for Non-Functionality of Matsanjeni North Inkhundla Water Points

The pie chart 8 above shows the reasons for non-functionality of water points at Matsanjeni North Inkhundla. The pie chart depicts that 19% of the water points were broken, 77% for dry water point and 4% for undeveloped borehole and other reasons. According to the findings of this mapping exercise as indicated above pie charts that 19% of the water points are broken and required rehabilitation under this constituency are listed on Table 4-B.

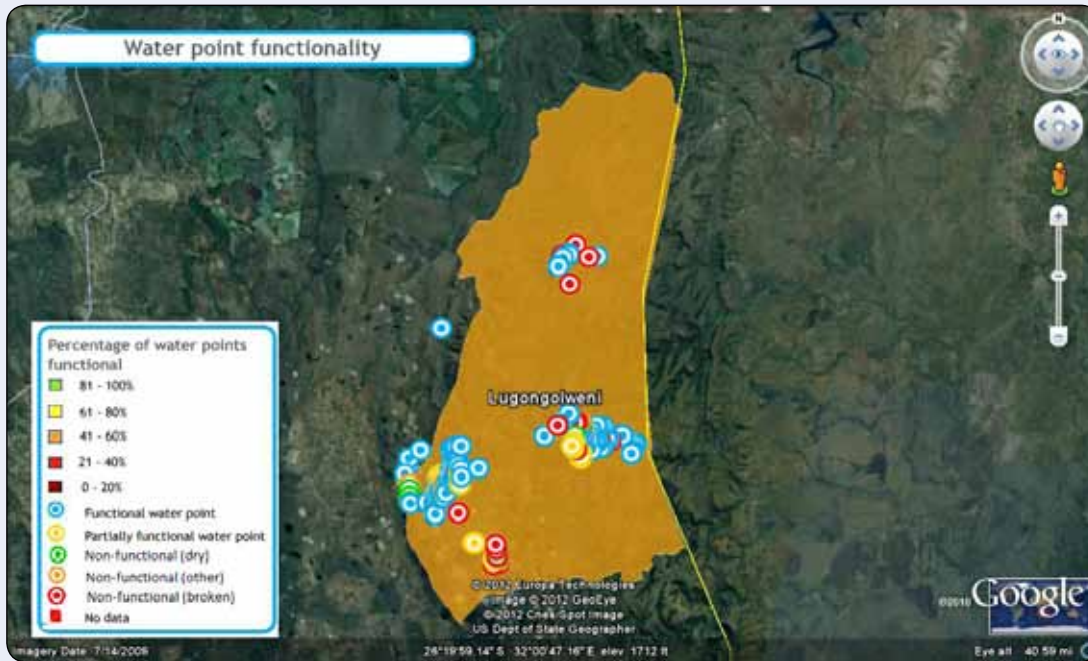


Graph 15 Presents Matsanjeni Inkhundla Sanitation Coverage by homesteads

The graph above shows that the total number of homesteads in this Ikhundla is 2989 and out of these, 2445 have access to toilets while 544 have no access to toilets. A further study that will inform whether the 544 has access to potable water points can be conducted at a later stage. There is still a need for intervention to ensure that all homesteads have access to proper sanitation facility.

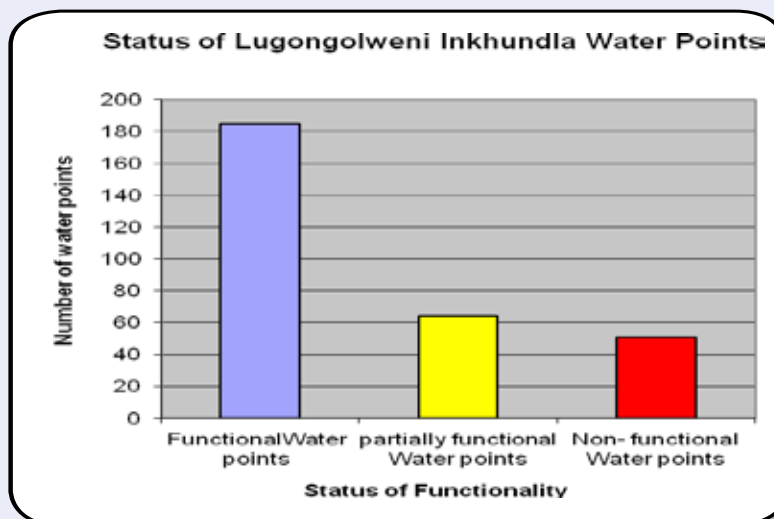


8.8 Lugongolweni Inkhundla



Map 9 Showing Lugongolweni Inkhundla Water Point Functionality and Distribution

The background colour of the map shows the percentage of the functionality of the existing water points in the Inkhundla while the coloured dots indicates the distribution of the water points and its functionality status. It shows that the functionality of water points at Lugongolweni Inkhundla ranges between 41% - 60%. It also depicts that the water points are concentrated in three different areas of the Inkhundla map. Although the map does not show the exact location of the residents, but the percentage of the functionality of the existing water points is too low as it is below 50% and unevenly distributed in the Inkhundla. This means that the population without access to potable water is very high. However, a further study that will show the location of the residents may be conducted in future and further study on rehabilitation of the water points. A detailed graph of the functionality of the water points is outlined below.

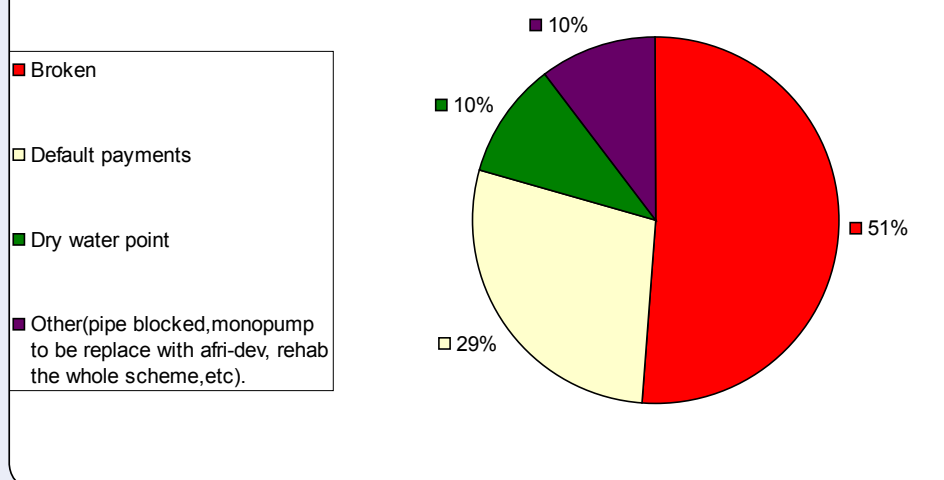


Graph 16 Presents Summary of Findings –Status of Lugongolweni Inkhundla Water Points

Graph16 above shows the number of functional, partially functional and non-functional water points at Lugongolweni Inkhundla. The graph shows that the total number of functional water points is 185 (61.7%), total number of partially functional water points is 64 (21.33%) and 51 water points were non-functional (17%).

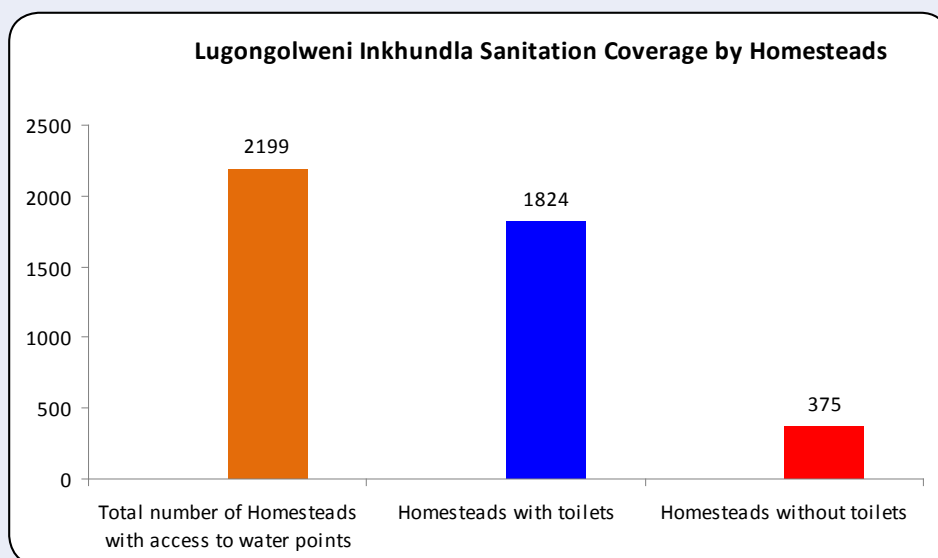


Reason for Non-Functionality Lugongolweni Inkhundla



Pie Chart 9 Reasons for Non-Functionality of Lugongolweni Inkhundla Water Points

The pie chart 9 above shows the reasons for non-functionality of water points at Lugongolweni Inkhundla. The pie chart depicts that 51% of the water points were broken, 29% for default payments, 10% for dry water point and 10% for pipe blocked and other reasons. Vukamatsetsa community water project and Maphatsindvuku water scheme are two of the reticulated schemes under this constituency that requires a major rehabilitation as these projects had exceeded its design period as determined by the finding of mapping exercise.



Graph 17 Presents Lugongolweni Inkhundla Sanitation Coverage by homesteads

Graph 17 above shows the total number of homesteads at Lugongolweni Inkhundla with access to water points and number of homesteads with toilets and number of homesteads without toilets. The data show that there are 375 homesteads without toilets at Lugongolweni Inkhundla out of those sampled during this exercise.



9. TABLE 4-A WATER SCHEMES THAT REQUIRES REHABILITATION.

MANZINI REGION				
Name of Inkhundla	Community Name	Water Supply & Sanitation Project Name	Type of Scheme	
			Micro	Macro
Mkhiweni	Mbelebeleni	Sentemani Mbelebeleni Water Scheme		x
	Sidvokodvo	Sidvokodvo	X	
	Mnjoli	Mnjoli	X	
	Likima	Likima	X	
Mafutseni	Sicamelweni	Sicamelweni		x
	Nkhonga	Nkhonga		x
	Mgcengcemeni	Mgcengcemeni		x
	Bhudla	Bhudla		x
	Maphopheni	Maphopheni		x
	Nzobeni	Nzobeni		x
Mtfongwaneni	Endonda	Endonda		x
	Gundvwini	Gundvwini		x
	Ngulutjane	Ngulutjane		x
	Sikhaleni Selusekwane I	Sikhaleni Selusekwane I		x
	Sikhaleni Selusekwane II	Sikhaleni Selusekwane II		x



TABLE 4-B

LUBOMBO REGION				
Name of Inkhundla	Community Name	Water & Sanitation Project Name	Type of Scheme	
			Micro	Macro
Siphofaneni	Phonjwana	Phonjwana		x
	Mphosi	Mphosi		x
	Kamkhweli	Kamkhweli		x
	Siphofaneni	Umzabalazo Wabomake		x
	Mphaphati	Mphaphati		
	Manyovu	Manyovu		x
 				
Mpolonjeni	Mpolonjeni	Mpolonjeni		x
	Mpolonjeni	Ngcina		x
	Kalanga	Kalanga		x
	Siphambosini	Siphambosini	X	
	Moyeni	Moyeni 3 hand pumps	Xxx	
 				
Matsanjeni North	Mambane	Mambane		x
	Mphundle	Mphundle		x

Above are the tables showing the non-functional water points that require major rehabilitation or replaced with new water points. A further study that will inform the extent of the rehabilitation and possible estimated amount required for the rehabilitation for all the above mentioned water points is required.



10. MANAGEMENT OF THE DATA (INSTITUTIONAL)

The Department of Water Affairs under the Ministry of Natural Resources and Energy is a custodian for the implementation of water and sanitation projects in the country. The Department of Water Affairs- National Community Development Office will manage the data while the Regional Community Development Officers from the Department of Water Affairs- Rural Water Supply Branch will be responsible for updating the national database periodically. A backup copy of this data will be stored at the National Development Data Centre (NDDC) at the Surveyor General's Office.

11. CHALLENGES ENCOUNTERED

- 11.1 Number of GPSs Not Enough – there were only 6 GPSs available for the 24 member team yet the whole exercise was underpinned by the use of the GPSs. The limited number of GPSs limited the amount of work that could be covered on a given day.
- 11.2 Personal Computers – personal laptops were used for data input, due to a lack of alternatives, and this created challenges because we didn't have control over personal laptops. The use of personal computers also posed challenges in terms of the possible damage to the computer.
- 11.3 Shortage of Transport – the government of Swaziland with its implementing partners provided few vehicles, however, the number of vehicles available for this project was limited and vehicle availability was inconsistent. This was a limitation for optimizing the available human resource. For instance, only 2 cars were available to the 12 member team in the Lubombo region. If more cars had been available to the team, the work done over the 5 weeks could have been completed much earlier than that. Not only was the number of cars a challenge but the policies associated with certain organizational/government cars were also a hindrance. For instance, government cars are neither permitted to be driven earlier than 8am nor be driven after 5pm, which made it impossible to work outside the authorized times. Government regulations also require that only authorised civil servants drive Government cars which also were a hindrance in expediting the implementation of the exercise.

11.4 Financial

- 11.4.1 Change in Sample Size – initially the mapping team had proposed a budget for approximately SZL E500, 000 to pilot 4 Tinkhundla. However, the budget was reduced to about SZL E300, 000 yet the sample size was increased from 4 to 8 Tinkhundla. The approved budget became limiting from the beginning of the exercise.
- 11.4.2 Delayed Receipt of Money – the failure to secure a local bank account in which money from WaterAid could be deposited presented the mapping team with a number of challenges. Paying for accommodation was one of the challenges



because some hotels demand deposit before granting accommodation. The delay in accessing the money also resulted to a shift in plans because certain activities could not proceed prior to the receipt of the money.

11.4.3 Limitations in Communication - communication in the field between teams was difficult because there was no budget for airtime. Access to internet was a challenge as well because some of the areas where the teams were accommodated did not have access to the internet.

11.4.4 Weather Conditions - Conditions also added to the challenges because most of the roads in the rural areas are gravel and become slippery after rainfalls.

11.4.5 Difficulty in Accessing Some Areas of Communities – accessibility to some parts of the communities that were piloted was a challenge using motor vehicles which was very time consuming. It was felt that access could be made easier with motor bikes.

11.5 Public Awareness on the Exercise – the team overlooked making the public aware of the exercise prior to its implementation. Although there was little resistance from the public, a lot of time was lost in data collectors introducing themselves to all the homesteads before marking a water point.

11.6 Data Collector Visibility - the data collectors had no identification clothing or cards which made it difficult for the communities to entertain or assist them.

11.7 Data Collection Form - proved cumbersome to complete, especially with reticulation systems where you needed to repeat the same information for different standpipes.

11.8 Consistency and Completeness of Data – it became apparent during coding of the data that much information was either missing in some forms or inconsistent thereby creating difficult in coding and analysing the information.

12. LIMITATIONS OF THE STUDY

The objectives of the pilot study among others were to ascertain the population served by the existing water points. The data collection form did not include a parameter for the population served by each water point. The data collection form included region name, population, Inkhundla name, population, community name, and population, project name and population, number of households using water point, number of homesteads using water point save for population using water points. The study mainly focused on water points hence the population for each water point was not obtained. The results showed the number of homesteads using the water points instead of population served by the water points.



13. RECOMMENDATIONS FOR FUTURE DATA COLLECTION

- 13.1 GPSs - Increase the number of GPSs to 8 per Region to speed up data collection.
- 13.2 Computers – 2 laptops should be available for each region.
- 13.3 Transport – 3 cars for each region and an equal number of motorbikes would suffice.
- 13.4 Communication – budget for airtime for all field officers for ease of communication between officers.
- 13.5 Public Awareness – run a programme on national radio to sensitize the nation about the mapping exercise as well as solicit its support for the exercise.
- 13.6 Data collector visibility – budget for clothing (e.g. T shirts) that will be worn by the field officers for ease of identification by community members.
- 13.7 Data collection forms – develop a separate tool for reticulation systems.
- 13.8 Local bank account – approach Micro projects for management of all finances relating to the project.
- 13.9 Improve data quality check(s) – train data collectors, capturers, and establish filter structures.

14. REFERENCES:

- Japan International Cooperation Agency study, (2004)
- Swaziland Population and Housing Census, (2007)



WATER POINTY MAPPING DATA ENTRY FORM RURAL

IDENTIFICATION-LOCATION DETAILS

Date of Data Collection:	Regional name and population:	Date of Commission:
Reference Number:	Inkhundla name and population:	Supported by:
Way Point ID in GPS:	Community name and population:	Photo ID:
Longitude(DD):E	Project name and population:	Date collector name & surname:
Latitude(DD)S	Name of Institution(if applicable):	
Elevation:	Number of households using water point:	
Land Ownership:	Number of homesteads using water point:	
Swazi Nation Land	Homesteads with toilets:	
Title Deed Land	Homesteads without toilets:	

WATER POINT DETAILS

Water Source:	Point Type:	Type of Hand pump (If applicable):	Taste:
River/Stream	Protected spring		Acceptance
Spring	Hand dug well	Infrastructure	Salty
Bore hole	Borehole fitted with manual pump	Type of System	Metallic
Point Functionality:		Reticulated	Rotten
Functional	Borehole fitted with submersible pump	Hand pump	Smell
Partially Functional		protected Spring	Smell
No-Functional(broken)	Borehole fitted with no pump	Water Payment	No Smell
Partially Functional	Monitoring well		Additional Comments
No-Functional(broken)	Standpipe for gravity fed pipe scheme	Community Contributes	
No-Functional(dry)		Community doesn't Contributes	
No-Functional(other)			
Reason not Functional if applicable	Standpipe for gravity fed Intake		
	Reservoir/storage Tank		
Date of Breakdown:	Valve		





Supported by:

