WIN-SA
WATER INFORMATION NETWORK
- SOUTH AFRICA -

F·I·E·L·D·N·O·T·E

March 2012

SMALL SCALE MULTIPLE WATER USE SYSTEMS

The Kagisano Stock Watering Pilot Project

1 Introduction & background

The South African government recognizes the importance of water for economic growth and development, and this is clearly articulated in the country's water policy and legal framework. The National Water Act (Act 36 of 1998) aims to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account the following aspects, amongst others:

- Promoting the efficient, sustainable and beneficial use of water;
- Facilitating social and economic development, and;
- Providing for growing demand for water use.

Furthermore, the focus of South Africa's water sector post 1994 has moved from supplying people with clean, reliable and safe water to the recognition of the potential for water to contribute to people's wider well-being and livelihoods. The sector has had to face the reality that household water needs extend well beyond domestic needs (that is, water for drinking, cooking and washing), hence its recent focus on Water for Sustainable Growth and Development.

The National Water Act and the sector's focus on water for sustainable growth and development support the provision of water for small scale multiple uses, to facilitate economic development and poverty alleviation.

Possible Small Scale Productive Water Uses in SA

Crops (cultivated on Private or Communal Land)	Stock	Other
Vegetable Gardens Fruit Trees Wetland Crops	Cattle Goats Pigs Sheep Chickens Donkeys / Horses	Brick Making Ice Making Traditional Beer Brewing Hair Salons Car Wash

Source: DWA

However, the reality is that schemes are not designed or planned to cater for more than basic domestic needs (drinking, cooking & washing). In particular, provision of water services for small scale multiple uses has not been well considered for such a long time, resulting in stagnant economic growth and development of the people. The norm has been provision of single water use systems that only cater for domestic use or sometimes one productive use such as irrigation. The situation has restricted people from becoming food secure, financially independent and has also restricted attainment of sustainable livelihoods.

Small scale multiple water use systems cater for the actual household water needs or activities of the community at a subsistence level, resulting in improved health and/or income generation.

The benefits Small Scale Multiple Water Use Systems include the following:

- It promotes integrated municipal planning through active engagement with communities and the involvement of various departments and institutions.

In order to accommodate the actual needs of a community, the municipality must actively engage with the community. Water needs of the community will also require active engagement of/ or input from other government departments and institutions. The needs of the community will be reflected in the planning documents (IDP, PSPs, etc). At this planning stage the roles and responsibilities of various stakeholders will be identified resulting in sustainable scheme. Integrated planning ensures better & efficient use of resources such as efficient agricultural practices e.g. drip irrigation techniques, in-field irrigation.

- It caters for actual needs of the community at a subsistence level.

Through active engagement of communities during municipalities' processes, the community needs will be reflected in the planning documents (IDP, PSPs, etc). During planning, the roles and responsibilities of various stakeholders will be identified resulting in sustainable scheme.

- It ensures better design of water supply systems.

Once the community water needs have been established, the water supply system can be accurately designed .This approach will ensure buy-in from the community, integration of hard core engineering solution with soft issues, and the consideration of mixed water supply.

- It generally brings improved cost recovery and reduced maintenance.

The rationale for considering community's actual water needs is to ensure that the community does not vandalize the system to gain illegal access to water for uses beyond domestic water needs and thus reducing maintenance costs. Also, there is an underlying belief that people are more likely and more willing to pay for services they generate income from. This ensures better cost recovery for municipalities.

- It leads to poverty reduction and improved food security at a household level. in that time saved by walking great distances to fetch water can now be spent on engagement in economic activities.

Provision of additional water for small scale multiple uses will ensure that householders can raise livestock, plant crops and start businesses resulting in financially stable and food secure households. Also, time spent on fetching water would be saved for income generating activities or better child care which positively impacts on health and education. Food at household level can be improved through backyard gardens thus helping diversify diet and consequently improve health status, especially for HIV/AIDS stricken communities.

- It promotes improved health and hygiene because people and livestock do not share the same water source.

By planning for the actual water needs of a community, it is unlikely that livestock will be watered at standpipes or from household drinking water supply. By having separate drinking water sources for animals and humans, the risks of transmitting diseases from animals to humans are reduced.

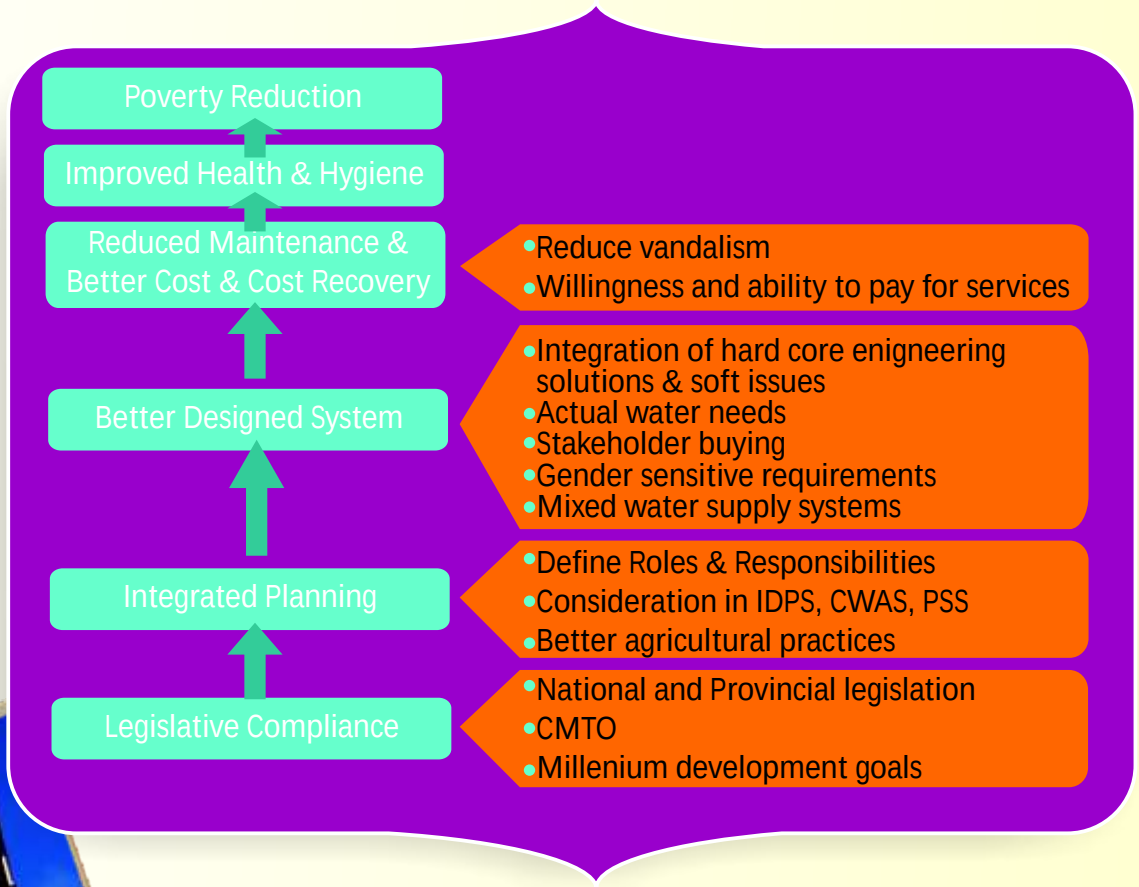
- It provides legislative compliance.

The provision of water for small scale multiple uses is a legislative requirement that is particularly acknowledged in two pieces of legislation in South Africa:

The 2003 Strategic Framework for Water Services (SFWS), which acknowledges that water for small scale multiple uses is necessary for the reduction of poverty and the improvement of livelihoods

The National Water Act (Act 38 of 1998), which aims to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account the following aspects, amongst others, which supports the provision of water for small scale multiple uses:

:Promoting the efficient, sustainable and beneficial use of water;
:Facilitating social and economic development, and;
:Providing for growing demand for water use.



benefits of planning and designing for small scale multiple use systems

2 The National Guideline for the Provision of Water for Small Scale Multiple Use Systems

With the above background and to turn the situation around, the Department of Water Affairs, whose constitutional mandate includes ensuring accessibility of water, is in the process of developing a National Guideline on Small Scale Multiple Uses of Water for poverty reduction and economic development. Such uses would include brick making, beer making, salons, car-washes, food gardening, ice making, etc, which are at household level and aimed at improving livelihoods.

The aim of the guideline is two-fold:

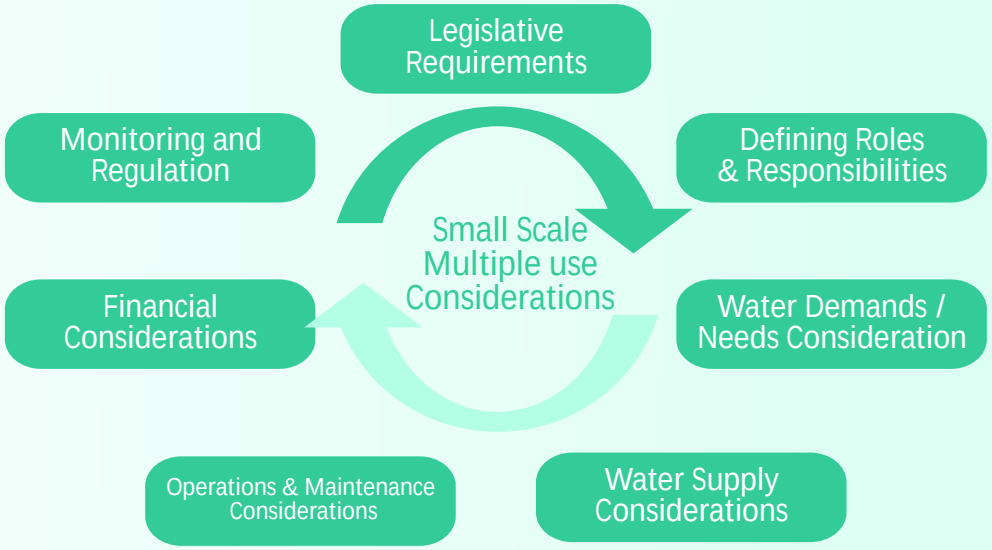
- To illustrate to municipalities that meeting the basic water needs of people is not just about satisfying health and hygiene requirements, but is also about poverty reduction, economic independence and improving livelihoods and,
- To guide municipalities in making domestic water supply a productive water supply hence satisfying legislative requirements and improving economic and social development.

Further, the guideline addresses the following areas:

- Determining Roles and Responsibilities of different government departments to ensure integration, co-ordination and long-term sustainability of the small scale multiple water use system;

> "A key benefit of the system is the ability to co-fund the scheme through various government, community and private sector funding initiatives and schemes. Going forward each Water Services Authority should be in a position to effectively and efficiently plan and design water services schemes that take into account small scale multiple uses of water."

- Water Demand Considerations in terms of determining the types of small scale multiple uses in the area of supply, how much water is required for small scale multiple uses, establishing whether the resource can support the demand, etc;
- Water Supply Considerations in terms of design criteria for new systems, upgrade of existing systems, efficient use of alternative sources and technologies, etc;
- Operation and Maintenance of the MUS in determining who is responsible for operating and maintaining the system t;
- Financial Planning addresses cost recovery, use of government funds such as Municipal Infrastructure Grant, Equitable Share Grant, Resource Poor Irrigation Farmers Fund, Rain Watering Harvesting Fund and Local Economic Development Fund;
- Monitoring and Regulation System and establishing effective M&R systems and regulating the use of water for small scale MUS's.

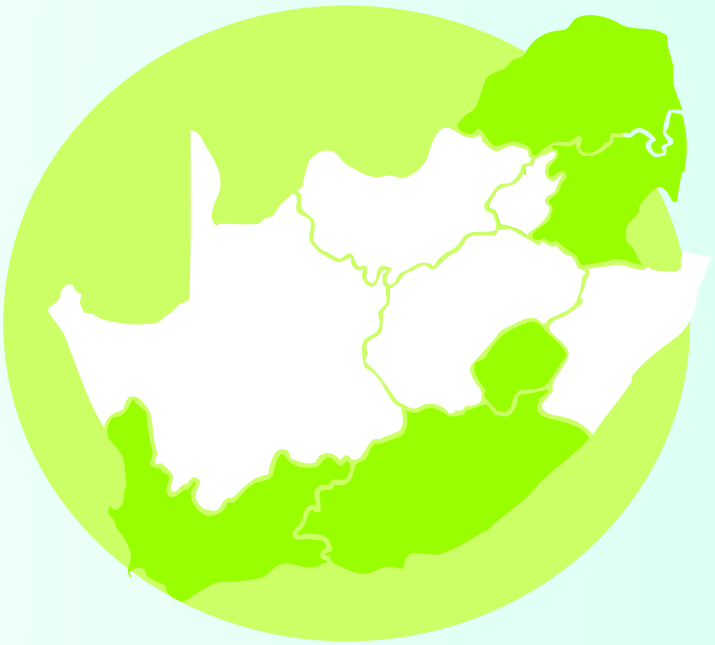


Key Areas for the Implementation of Small Scale Multiple Use Systems

Often, resistance to implementing multiple use systems is largely due to a lack of understanding of such systems, including limited knowledge on the financial, technical and institutional implications, and a lack of guidance on how to implement multiple use systems.

The process of developing the national guideline on small scale multiple uses of water for poverty reduction and economic development has involved the following activities:

- Assess the water demands for small scale poverty alleviation projects at community level in 5 provinces, namely: Free State, Gauteng, Kwa Zulu Natal, Northwest, and Western Cape.
- Using lessons from the case studies to inform and upgrade the guideline.
- With the help of regional offices and municipalities, select one project for piloting the guideline.



Map showing the provinces in which assessments of water demand for small scale poverty alleviation were done.

3 The Kagisano Stock Watering Pilot Project

The Kagisano Stock Watering Project is a pilot project implemented as part of the process of testing/piloting a national guideline on small scale multiple uses of water for poverty eradication and economic development.

The Area

Kagisano Local Municpality (KLM) is one of six local municipalities that make up the Dr. RS Mompati District Municipality (DRSMDM) which is located in the western portion of the North West Province.

The KLM essentially comprises the Ganyesa Magisterial District, and a small portion of the Vryburg magisterial district in the eastern and northern portions of its area of jurisdiction. The Local Municipality is seated in the large village of Ganyesa, some 70 km north west of Vryburg. The total area of the Kagisano LM is approximately 10,000 km2, or 1 million ha.
The KLM has a total population of approximately 108,000 people (Census 2001 escalated to 2008), resident largely in some 158 villages, but also resident on commercial farms, and State owned farms. Only 1 of the villages in the study area has a population in excess of 10,000, being Ganyesa. A further 2 villages have a population in excess of 5,000, and a further 2 in excess of 3,000. Only 17 of the villages have a population estimated in excess of 1,000 people.

According to the DWA Reference Framework for the KLM, 79% of the population has adequate access to free basic water (FBW) supply, and a further 6% has limited access to FBW. Only approximately 35% of households have access to adequate basic sanitation (VIPs), with the rest making use of unimproved pit latrines for sanitation purposes.

The KLM includes no formal towns, very limited areas of freehold commercial farms (only in the east and north), and comprises almost entirely of scattered traditional settlements, South African Development Trust (SADT) farms, and communal farmland, operated as communal grazing land, with very limited dry land cropping.

The KLM comprises largely of scattered traditional rural settlements, with a few larger villages. The largest sectors of economic activity in the KLM's area are commercial agriculture and Government, with State pensions and grants being one of the largest sources of income to residents. Other economic activities include very limited ecotourism, transport and fundamental agro-processing.

The principal agricultural activities in the traditional areas are subsistence farming, mainly stock farming with a limited degree of dry land crop farming. Generally, the performance of subsistence farming in these areas has not been sound, and is often not commercially sustainable.

The KLM is located in a relatively water scarce region, with annual rainfall ranging from 350 – 400 mm/a, and mean annual evaporation well in excess of 2,000 mm/a. The region is not crossed by any major perennial rivers, and has no dams of any note. All water is supplied exclusively from groundwater resources, generally from localized boreholes.

Stock Watering Requirements

The total water demand requirements for all stock watering requirements in the study area are summarised as shown hereunder:

Consumer Group	Consumer Group					
	Consumer Group					
Consumer Lands	880	47	722	112	-	1 111
SADT Farms	508	23	40	16	-	588
Communities	680	109	132	194	198	1 293
Total	2 048	180	244	322	198	2 992

The total water demand for basic water supply for the entire human population of the study area is estimated at approximately 3,420 kl /d, which implies that the volume required for stock watering purposes in the study area is equal to approximately 88% of that required for human basic water supply. It can also be noted that the largest single component of the total volume of live stock water required is likely to be in and adjacent to communities, and the smallest component on the SADT farms.

Stock Watering Gap Analysis

If it is assumed that the total stock watering requirement for the study area of 2,992 kl /d is divided between the 141 watering points, of which 137 are supplied from windmills, this amounts to a water supply requirement at each watering point equal to approximately 0.5 l /s over a 12 hour period each day. This level of supply is considered reasonable for the local resources, and it can therefor be concluded that there should be adequate resources in the region to meet the stock watering demand in general, although this may vary from community to community, and where the livestock density is much higher than the average throughout the study area.

However, the borehole status assessment done by Department of Water Affairs indicated that only 30% of stock watering windmills were fully functional. It is therefore concluded that the challenge with respect to stock watering in the region is not the availability of the primary water source for stock watering purposes, viz. groundwater, nor even the extent of infrastructure, i.e. the number of stock watering water points and windmills available, but rather the small number of these which are functional, which obviously impacts on the access of livestock to adequate water supply.

The Project

The Kagisano stock watering pilot project focuses specifically on addressing the stock watering challenges of the Kagisano Local Municipality, with a view to identifying a model which may be rolled out to address the other traditional areas in the DRSMDM, as well as possibly other similar areas elsewhere in the Province and South Africa.

Inquiries at the local level have indicated that the majority of families living in the Kagisano area own livestock of one form or another, ranging from 1 or more donkeys to collect water, to a few head of sheep, goats or even cattle as a form of saving and status enunciation

.

The project is mainly targeted at farmers at cattle posts, communal farmers, and subsistence farmers.

The project has been necessitated by the following challenges facing the area:-

- Existing stock watering infrastructure in the region has not been maintained for a long period of time, and has deteriorated to a significant degree. A substantial refurbishment effort will be required to rectify this situation.
- Responsibility for the operation and maintenance of stock watering infrastructure in the study area is presently poorly defined, and the present agencies which have funding available to refurbish the existing infrastructure are reluctant to make the funding available until a sustainable strategy is adopted for the future maintenance of the infrastructure to be refurbished.
- Provision and maintenance of stock watering infrastructure is not an activity which can be provided in isolation, since if incorrectly applied it can in fact do more damage to the beneficiary communities than good. It must therefore be part of a holistic development effort which addresses all aspects of farmer development to the greater good of the beneficiary communities as a whole. The sustainability strategies to be adopted for the maintenance and operation of stock watering infrastructure in the study area must be implemented in this context.

S. Thue, former Kagisano LM Councillor and local champion of the pilot project

One of the refurbished windmills.

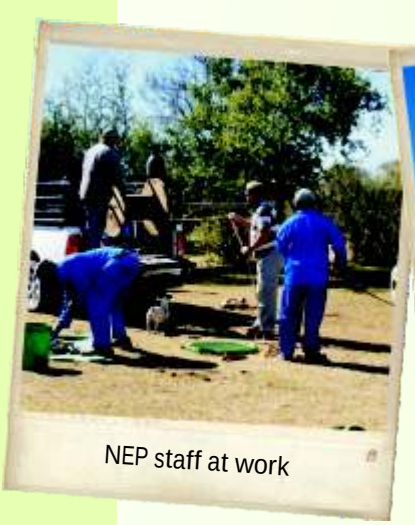
Project Implementation

A total of 63 stock watering windmills that needed repair or maintenance in one form or another were identified, with a further 33 needing replacing completely. A detailed assessment of the refurbishment work required was undertaken by Bigen Africa for 19 stock watering facilities in the Kagisano LM, and this assessment included detailed identification of the work required to refurbish the boreholes and infrastructure for each facility

Some of the old infrastructure that had to be replaced

The communities in which the work was implemented, as well as a brief description of the work in each case, are as follows:-

- Eskdale (2 boreholes) – Replace existing broken pump with a new windmill. Replace broken windmill with a new windmill and cattle drinking trough (CDT)
- Itereleng – Drill 1 new borehole to replace two contaminated boreholes, and equip with a windmill from one of the existing contaminated boreholes, plus 1 new CDT.
- Kgokole (2 boreholes) – Replace borehole pump and engine, construct new windmill and 2 CDTs.
- Dipodi - Drill 1 new borehole to replace contaminated borehole, and equip with windmill from existing contaminated borehole, plus new CDT.
- Austrey - Drill 1 new borehole to replace collapsed existing borehole, and equip with the windmill from the existing collapsed borehole, plus new CDT.
- Tshetsu – Refurbish windmill and construct new CDT.
- Morokweng - Drill 1 new borehole to replace contaminated and collapsed boreholes, and equip with windmill from existing contaminated borehole, plus new CDT.
- Maheng - Drill 1 new borehole to replace contaminated borehole, and equip with windmill from existing contaminated borehole, plus new CDT.
- Makalaathutlwa – Drill 1 new borehole to replace contaminated borehole, and equip with windmill from existing contaminated borehole, plus new CDT.
- Pautlane - Drill 1 new borehole to replace contaminated boreholes, and equip with windmill from existing contaminated borehole, plus new CDT.
- Setabeng – Replace borehole pump and engine, refurbish pumphouse and construct new CDT.
- Tseoge – Drill and equip 1 new borehole with new windmill and CDT.



NEP staff at work

The project team at one of the sites

The total estimated human population for the above mentioned communities is about 22,006, with about 34,029 livestock (mostly comprising cattle, sheep, goats, equines, and chickens).

The Project

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Institutional arrangements

The project was funded by the Departments of Water Affairs, and was imple-mented by the Dr Ruth Mompati District Muni-cipality through NEP Consulting Engineers. The municipality took ownership by managing the project, the resources and ensuring that objectives of the project were met.

A dedicated Project Steering Committee (CoGTA, Dr Ruth Mompati DM, and Kagisano LM, DWA North-west region, DWA Head Office, CoGTA Northwest, the Tribal Office, and DAFF) that met on the monthly basis within the Kagisano Local Municipality provided the platform to raise issues as they arose.

At the community level, chiefs, councillors and community members participated in the project from the beginning, thereby ensuring that the communities were fully engaged in the project. For each windmill, two community members were appointed by fellow community members, to oversee the work being done by the implementing agency. The communities were further capacitated on how to maintain and run the windmills.

> "As a community, we have taken ownership of this project because we realise that it will help to minimise the farmers' dependence on the government"
>
> *S. Thue, former Councillor and local champion of the pilot project (Kagisano LM)*

In order to ensure continued maintenance and sustainability of the assets (windmills), the farmers agreed to contribute R5.00 per month for famers with large herds of livestock and R1.00 per month for farmers with small herds. These funds would be used for minor maintenance, and in cases of major breakdowns, the Dr. RS Mompati District Municipality (DRSMDM) would intervene.

Lessons learnt

Despite lack of interest of support from invited stakeholders the District Municipality played a valuable role in directing resources, and it was clear they ensured that aims and successes of the pilot are prioritised. Selected lessons and achievements of the Kagisano Stock Watering Pilot Project are listed below.

- All relevant stakeholders need to be involved from the beginning in order to ensure that there is ownership of the project and responsibility for the system afterwards. Despite the fact that not all stakeholders were active in the project, they were all notified of the progress of the project.

- Securing a competent implementing agency is critical to the success of the systems. In this project, the NEP Consulting Engineers demonstrated technical effectiveness and sophistication on the project, and therefore ensured that they passed on the skills and knowhow on the maintenance of the systems to the communities.

> "The role and responsibility of each stakeholder should be clearly defined prior to the design and/or implementation of the system. A lack of proper consultation may result in a duplication of functions, fruitless expenditure and a lack of proper operation and maintenance of the system."
>
> (MUS Draft Guideline, DWA)

- Community participation in community based projects is always a critical success factor. The active participation of local leaders (chiefs and councillors) made the project a wholly community-driven and owned process. The communities saw the benefits the project would bring to them, and this motivated them to take ownership and ensure that the project was a success.

- The project has impacted the communities positively and was thus more than just a learning tool for the guideline, i.e. the community has seen the pilot as government step towards bettering their lives.

- The pilot provided a solid foundation for the municipality to realise the needs of the communities that can be stimulated by the availability of water (i.e. stock farming). It has thus been an eye opener for the municipality to undertake similar projects for other communities in the area that did not benefit from this pilot project.

- The project has demonstrated that provision of water beyond water services, has the potential to improve people's lives. The additional supply of water in Kagisano has allowed the community to undertake productive stock farming. The project thus demonstrates that with additional water supplied, communities can engage in economically productive activities such as food gardening, bread making, car wash, hair salons, etc.

- Although much more remains to be done, the project has dramatically changed the face of the area, particularly in terms of livestock farming. The results of the pilot demonstrate that it is pro-poor initiative that has clearly contributed to poverty alleviation in the area.

- It is important that each stakeholder is made to understand, from the beginning, what exactly they are expected to bring to the table and how that will help the project. Initially, the roles and responsibilities for stakeholders involved in the implementation of the Kagisano pilot project were not clearly defined, and this made it difficult to ensure that they participated fully, until later when Terms of Reference were developed.

- The District paid the implementing agency on delivery, despite the fact that the Department of Water Affairs (DWA) had transferred money to municipality in advance. This made a significant difference to the project as very little work was undertaken at risk.

> "We can achieve more if projects are properly monitored"
>
> *S. Thue, former Councillor and local champion of the pilot project (Kagisano LM).*

Challenges

Although the project was implemented without any major setbacks, some challenges were still experienced:

- One of the biggest risks of the project was the assumption that the boreholes still had sufficient water resources to supply the communities. This may still pose a challenge in future, thus borehole yields still need to be assessed in order to ensure continued supply of water.

- Vandalism was also one of the challenges faced on the project. One of the sites (Austrey 2) was vandalized, leading to the abandonment of the site in preference of a similar site with the same needs.

- Important expertise and input from some key stakeholders (national departments) was missed in the project due to poor representation from them. The project would have benefited much more had these stakeholders participated.

Overall, a key challenge is to elevate the idea of Multiple Use System of water to a more strategic level where it can be adopted as a policy by the Department of Water Affairs and implemented by municipalities. This is quite a challenge as a number of municipalities are still struggling with sustainable water services provision currently.

5 Conclusion

The project has demonstrated that indeed small scale multiple water use systems have the potential to improve livelihoods, and contribute to poverty alleviation and the attainment of sustainable livelihoods.
It is an important aspect of water services provision and must be taken into account by the sector as a whole, through the municipalities.

- To illustrate to municipalities that meeting the basic water needs of people is not just about satisfying health and hygiene requirements, but is also about poverty reduction, economic independence and improving livelihoods and,
- To guide municipalities in making domestic water supply a productive water supply hence satisfying legislative requirements and improving economic and social development.

Acknowledgement

The project team wishes to acknowledge the contribution and support of the following individuals:

TC Rasikhanya (DWA)
OI Khumoeng (DWA)
A. Ackerman (NEP Consulting)
S. Thue (Kagisano LM)
B. Mbentse (DWA)
H. Fundzo (DWA)
N. Dube (DWA)
J. Mwale (WIN-SA)
T. Moche (DWA)
K. Dijwe (Kagisano LM)
M. Chwene (Dr Ruth DM)
H. Myburgh(NEP Consulting)
O. J. Moeng (Traditional Affairs)
M. Makhuvela (DWA)

Written by: Juliet Mwale
Editors: Tenda Rasikhanya and Ishmael Khumoeng
Information supplied by: DWA & NEP Consulting Engineers

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WATER RESEARCH COMMISSION

water affairs
Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Address: 491 18th Avenue, Rietfontein, Pretoria
Postal Address: Private Bag X03, Gezina, 0031
Tel: (012) 330 0340 Fax: (012) 331 2565
E-mail: info@win-sa.org.za
Website: www.win-sa.org.za