Policy brief

INNOVATION FOR INCLUSIVE DEVELOPMENT

29 November 2018

INNOVATION FOR BASIC SERVICE DELIVERY: THE IMPACT OF POINT OF USE (POU) WATER FILTERS

EXECUTIVE SUMMARY

While the South African government has made significant progress in improving access to basic services such as water, sanitation and energy since the advent of democracy in 1994, huge backlogs persist especially in rural and informal communities (DCOGTA, 2015). Many rural residents still lack access to safe potable water and therefore consume untreated water from dams or rivers that do cause certain illnesses. Through its Innovation Partnership for Rural Development Programme (IPRDP), the Department of Science and Technology (DST) has in partnership with science councils, universities and the private sector demonstrated point-of-use (POU) water filters in rural communities as an innovative way to deliver drinkable water to households. This policy brief explains what benefits have accrued for households which have received these POU filters .[1] More specifically, this brief reflects on whether or not this technology addresses relevant needs, the extent to which the technology is acceptable, and its impact on households' access to

[1] This brief is part of a series of policy briefs. Two other policy briefs focus on lessons learnt in relation to the demonstration of IPRDP technologies in rural settlements, and municipal innovation maturity in relation to IPRDP technologies.

clean water and their quality of life. Answering these questions is important in determining whether or not POU filters should be further rolled out or discontinued. The focus here shifts from issues of novelty, quality or scientific standards of the POU filters, towards practical concerns of their relevancy, acceptability, utility and value addition.

POLICY CONTEXT

Access to water is a right enshrined in the South African Constitution. In efforts to ensure the realisation of this right for all South Africans, the government has undertaken many policy and strategy reforms since 1994. Among the key policy documents that shape the current water policy in South Africa are: the 1997 White Paper on Water Policy (DWAF, 1997a); the Water Services Act of 1997 (DWAF, 1997b); the National Water Act of 1998 (DWAF, 1998) and 2004 (DWAF, 2004); and the National Water Resource Strategy (NWRS 1 and NWRS 2; DWA 2012).

The White Paper and the two Acts are complementary and provide not only a framework for sustainable water resource management, but emphasise the need for enabling improved and broadened service delivery. For example, the 1998 National Water Act emphasises the need for efficiency, equity and sustainability in the use of the water resources. Similarly, the Water Services Act provides for the provision of basic water and sanitation services to consumers by water authorities in an affordable, efficient and sustainable manner. Additionally, the two strategy documents prioritise the need to support the provision of water services, that is potable water and safe sanitation to all people with a particular emphasis on the poor and previously disadvantaged.

While this set of progressive policy documents has put South Africa among the leaders in water reform legislative frameworks, their implementation has been inadequate, and they have not adequately translated to improved access to water for many in the rural areas. It is against this background that new or improved ways of improving service delivery, especially in marginalised rural contexts, are crucial.

The potential of Science, Technology and Innovation to address service delivery and other development challenges have been acknowledged in South Africa (DST, 2018). Accordingly, there is policy priority and focus on finding new and better means to deliver basic services, especially in marginalised settings.

DEMONSTRATING THE POU FILTERS

The DST, through the IPRDP, has been demonstrating several water, sanitation and energy technologies aimed at improving access to basic services across the distressed municipalities in South Africa (see Hart et al., 2018). One such technology is the POU water filtration device, which has been demonstrated as a potentially effective intermediary water service treatment mechanisms for households in rural communities. It should be noted the POU filters were designed as an interim measure and they are not meant to replace water infrastructure roll-out in marginal communities.

Although not the focus of the policy brief, certain limitations of the technology need to be noted. While the POU filters are technically capable of removing microbial contamination often found in rural water resources, it does not remove heavy metal pollution in areas where this is a concern. Where these filters can be used therefore is an issue that needs careful consideration. It is also important to note that the filters need to be cleaned regularly in order from them to remain effective.

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The data analysed for this policy brief involved a sample of 125 households, 45 of which were beneficiaries of the POU filters from the Malatane and Klipheuwel settlements (Capricorn district, Limpopo Province), while 80 were non beneficiaries for comparison purposes. The non-beneficiaries are household which did not receive filters from the same settlements as well as other nearby areas that have similar geographical, political, socio-economic and basic service access characteristics.

Two rounds of data collection were conducted. The first round of the survey focused on baseline data collection and was done in March 2017, and was a retrospective baseline survey. The households answered questions about their socio economic and access to basic services before the demonstration of the technologies. The follow-up survey was done in March 2018, and the beneficiaries of the technologies answered question about their experiences with the demonstrated technologies, in addition to their current socio economic status and access to basic services.

The baseline data show that overall, the sampled households, both beneficiaries and non-beneficiaries, were mostly female headed, and largely depended on social grants. They were characterised by low income and employment levels, as well as low levels of access to and satisfaction with basic services before receiving the water filters. However, there were significant differences between beneficiaries and non-beneficiaries of point of use water filters in their baseline socio economic characteristics and water access levels. The beneficiary households were poorer, and had lower levels of basic service access than non-beneficiary households before the intervention. These results indicate that the targeting mechanism of the IPRDP was effective, with poor households in areas with severe water access challenges benefitting from the intervention.

IMPACT OF POU FILTERS

The key water challenge in Malatane and Klipheuwel is that of water quality. In these communities, households access water through a community water scheme which pumps untreated water from the Olifants River into a reservoir, which is then gravity fed into communal taps in these villages. Households reported that they were unhappy with the cleanliness and quality of the untreated water for especially drinking. This makes them vulnerable to waterborne diseases.

Table 1 shows a significant increase in the satisfaction of households concerning water quality after receiving the water filters. Prior to receiving the water filters, 52% of the households were not satisfied with water quality, with about a third reporting being extremely dissatisfied. After receiving and using water filters, only 4% of the beneficiary households were not satisfied with water quality, with none of them being extremely dissatisfied. Overall, 96% of the households that received the filters were satisfied with the quality of water that they harvest from the device.

The households produced on average 60 litres of clean water per day using the water filters, which they use mostly for drinking purposes. Table 2 shows that 80% of the households were satisfied with the volume of water produced using the water filters. Ten percent of the beneficiary households reported that they share the cleaned water with neighbours, implying that the water filters benefit the greater community.

Table 1: Satisfaction of water quality in baseline and follow up of the survey among beneficiary households (n=45)

Water quality satisfaction level	**Percent**	
	baseline	**follow up**
Extremely dissatisfied	29	0
Dissatisfied	23	4
Satisfied	39	36
Extremely Satisfied	9	60
Total	**100**	**100**

Table 2: Satisfaction level with water quantity in round 2 (follow up) of the survey among beneficiary households (n=45)

Water quantity satisfaction level	**Freq**	**Percent**
Extremely dissatisfied	0	0
Dissatisfied	9	20
Satisfied	22	49
Extremely Satisfied	14	31
Total	**45**	**100**

The majority the households (62%) who received filters indicated that the device extremely easy to use, while an overwhelming 94% of households found it easy to clean the device (Table 3). This shows that the POU water filters are user friendly. However, despite the high satisfaction levels with the water filters, a significant percentage of households (42%) was no longer using them at the time of the follow up survey in 2018 (Table 4). The two main reasons given were that the municipality is now providing clean water to households, or that the devices were no longer working properly. Additionally, others were frustrated by the fact that the filtering process takes a long time to produce the volumes they needed.

Looking into the future, over two thirds (63%) of the households indicated that they were either likely (38%) or very likely (25%) to maintain the water filters at their own costs, but a significant proportion (38%) reported otherwise (Table 5). Discussions with household revealed that the reason was not necessarily unwillingness, but that of ability to do so.

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We conclude that the filters have positively affected the households' quality of life by improving their access to clean water - which the households felt was comparable to bottled commercial water. However, a constraint observed is that the filters broke down easily, raising doubts on its sustainability once the technical support from the Vulamanz implementation team is withdrawn.

Table 3: The ease to use and cleaning of POU filters

Ease to use POU filters	Extremely easy	62%
	Easy	33%
	Difficult	5%
Ease to clean the POU filter	Extremely easy	62%
	Easy	32%
	Difficult	6%

Table 4: Households that are still using the POU filters

Stopped using POU filters	Yes	42%
	No	58%

Table 5: Likelihood of future investment in POU filters

Likelihood to maintain the POU filter at own cost	Highly unlikely	8%
	Unlikely	29%
	Likely	38%
	Extremely likely	25%

CONCLUSIONS AND POLICY ACTIONS

Improving service delivery in the marginalised settings such as rural areas requires new and improved ways of doings things. The focus should not be on finding technologies that not only meet scientific standards, but those that address the relevant needs of the poor in affordable ways. This brief has shown that the POU filters represent that class of technologies that can improve access to clean water and quality of life of the people located in rural areas, at least in the short-to-medium term before centralised water treatment and distribution systems are installed.

Recommended policy actions are:

1. Municipalities should consider taking up the roll-out of POU filters in their Integrated Development Plans (IDPs) as an interim measure in communities where there is an urgent immediate need for clean drinking water.
    - The locations of these interventions however should be considered carefully since the POUs are only appropriate for areas where heavy mental contamination is not evident.
2. The further development of the POU should be supported by DST and science partners.
    - There is a need for the filters to be redesigned for durability, so poor households can continue using them for a considerable period without incurring significant maintenance costs.

3. Overall, mechanisms that foster a strong relationship between universities, research councils, private players and municipalities at the local level should be developed.[2] It is suggested that these relationships should result in the development of relevant innovations that address local needs which are then adopted by locals.

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[2] A need for this was identified in the larger study, and this is an appropriate action related to the POU technology.

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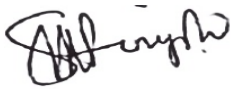

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