Water Works

An independent evaluation

Malawi, December 2017

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Acronyms

CLTS	Community Led Total Sanitation
DPO	Disabled Person's Organisation
EHO	Environmental Health Officer
FEDOMA	Federation of Disability Organisations in Malawi
FGD	Focus group discussion
GoM	Government of Malawi
HSA	Health Surveillance Assistant
KII	Key informant interview
MHM	Menstrual hygiene management
MoH	Ministry of Health
MoLGRD	Ministry of Local Government and Rural Development
PTA	Parent and Teacher Association
PHAST	Participatory Hygiene and Sanitation Transformation
TA	Traditional Authority
VDC	Village Development Committee
VHC	Village Health Committee
VSL	Village Savings and Loans group
WASH	Water, sanitation and hygiene
WESNET	Water and Sanitation Environmental Network

Acknowledgements

Thanks to those who openly shared their experiences, observations, frank insights on the challenges faced and recommendations as part of the visit. Many thanks to Jeff and Simon Cohen for making the preparations and to Yee Chen and Maya Kachenga for supporting and organising the visit and making sure that everything ran smoothly.

Front Cover Photo: Community handpump in Kwayera

Executive Summary

The findings are rated according to Inadequate, Satisfactory, Good and Outstanding.

Area	Performance indicator	Notes
Impact	Good/ Outstanding	The project achieved a good impact on water availability and water quality. The time to collect water has been reduced. And most households in the communities were within 15 minutes of the new pump. The waiting time at the water point was also reduced, but this was partly undone by the effects of population increase in some communities. The project had improved sanitation facilities at home. However, the positive impact is compromised by the lack of functioning hand washing facilities. Extended contact time with communities might improve impact on sanitation and hygiene.
Relevance	Good	The coverage of water and sanitation facilities in the target areas was relatively low. The project met as-yet unserved or partially served community needs for access to improved water supplies, it provided sanitation infrastructure and supported improved hygiene practices at the community level. However, the project is not entirely consistent with the national policy or the MoIWD guidelines for the WASH sector as described in the ODF Roadmap.
Sustainability	Satisfactory/ Good	The project has demonstrated an innovative approach to ensure sustainability of water points. These approaches used have shown good performance to date, with the potential for long-term sustainability. More attention is required to the sustainability of the latrines – elsewhere a prolonged period before communities are declared ODF has proved effective in sustaining ODF (or the risk of potentially withdrawing ODF status?). Water Works approach goes beyond technical aspects to institutional strengthening suggesting the potential for lasting value
Efficiency	Good	The project reached most of its targets within the timeframe and budget. Water Works has very good data management and M&E systems in place. The project achieved the targets as well as strengthening the capacity of the local health systems.
Effectiveness	Good	This was an effective and flexible project that reached or even surpassed its targets. It aims to strengthen districts and community structures. In the main the toilets distributed to families are being used and maintained properly

1. Introduction to Water Works

Water Works was founded in response to the lack of sustainability of the water points in Malawi and since 2009 has worked in partnership to develop simple, innovative and sustainable hand pump technologies that can be built and maintained by rural communities, using locally available and low-cost materials. To ensure that all the water pumps remain operational, Water Works has established a water point repair service. A system of payments by the village users will be set up to raise money for the pump's maintenance. Along with training villages in the water pump technologies, Water Works, alongside the Ministry of Health, mobilises communities to improve their sanitation facilities and engages HSAs to run hygiene awareness campaigns to ensure that the communities gain the most form their improved facilities. Water Works remains accountable after the project: includes checking that the well surrounds are in good condition, backfilling stagnant pools of water and ensuring the pump is used properly. If the pump is broken, Water Works will repair it, charging for parts and labour.

Project introduction

This project "Community Led Water, Sanitation and Hygiene Improvement in Traditional Authority Malili, Lilongwe". The project is located in Chitedze, Malili, Lilongwe, Malawi. Fifty villages with an estimated population of 10,000 would gain access to safe drinking water, at least 3,000 people would take part in hygiene awareness campaigns and over 1,600 households would receive support to construct latrines. Water Works was awarded a grant by DFID that commenced in September 2015 and finished in January 2018. The DFID grant was for assisting 50 villages in the Chitedze areas to meet their water and sanitation needs. The specific objective of the project is to reduce the prevalence of water, sanitation and hygiene related disease in the Chitedze Centre catchment area, TA Malili, Malawi by empowering community members to meet their water, sanitation and hygiene needs. This was to be achieved in two main phases. Firstly, the Ministry of Health deployed teams of Health Surveillance Assistants (HSAs) from the Chitedze Health District in mobilising the communities to address and improve their water, sanitation and hygiene behaviours through the application of the approaches Community Led Total Sanitation (CLTS) and Participatory Hygiene and Sanitation Transformation (PHAST). Secondly, Water Works assisted the communities to meet their water, sanitation and hygiene goals through protecting water resources with simple, innovative and sustainable hand pump technology and supporting vulnerable households to construct latrines and hand washing systems. Finally, Water Works will establish a water pump repair service to ensure that all 94 water points installed by Water Works since 2010 remain operational.

The project outcomes and outputs are as follows:

Outcome	Men, women and children in target communities in Malili, Malawi have increased safe access to potable drinking water, improved sanitation and better hygiene; thus, are protected from water borne disease. This will be achieved by empowering community members to meet their water, sanitation and hygiene needs.
Output 1	At least 2550 men, women and children from 50 villages (30 percent of the population over 5 years old) participate in a hygiene awareness programme leading to an increased knowledge of improved water, sanitation and hygiene practices.
Output 2	Over 1800 household latrines and hand washing facilities are constructed, with additional assistance provided to, at least, 188 vulnerable households, leading to access to improved sanitation and hygiene for 8500 men, women and children.
Output 3	50 water points are constructed, leading to access to potable drinking water for 8,500 men, women and children.

Output 4	A water pump repair service is established, leading to increased water point sustainability of Water Works' 94 water points.

Methods

The aim of the independent evaluation of Water Works' project is twofold:

1. To verify (and supplement where necessary) the Water Works' record of achievement as reported through the Annual Reports and defined in the project log frame;

2. To assess the extent to which the project was good value for money, which includes considering:
    - How well the project met its objectives;
    - How well the project applied value for money principles of effectiveness, economy, efficiency in relation to delivery of its outcome;
    - What has happened because of DFID funding that wouldn't have otherwise happened; and
    - How well the project aligns with DFID's goals of supporting the delivery of the MDGs.

The evaluation process had three component methodologies:

- **Literature review;** reports and relevant documents including proposal, project documentation (i.e. Annual Reports mid-term reports, and field reports), Water Works documentation (strategies, plans) were reviewed. Water Works theory of change/log frame were interrogation and analysed, relating the results to the evaluation questions
- **Focus Group Discussions and Interviews** with the households, Area Pump Mechanics, Health Surveillance Assistants, Environmental Health Officer, Water Point Committees and Pump Minder as well as other stakeholders on participation and engagement in the planning and implementation of interventions. The water users and Water Committees were interviewed about their satisfaction, and on financial and maintenance issues.
- **Physical inspection** and field observations. A physical inspection of the facilities was carried out to assess the quality or suitability of the facility through completion of a checklist to assess functionality and potential for sustainability. In addition, the condition and hygiene of the apron and drainage channel were checked. Communities were involved during the inspection and this included checking hand washing facilities, the state of the toilet infrastructure, water storage facilities and other sanitation structures such as rubbish pits and drying structures.

The high-level evaluation questions used the OECD-DAC evaluation criteria of relevance, effectiveness, efficiency, sustainability and impact. The aim was to ensure as far as possible that each evaluation question is evidenced from at least two information sources. To ensure validity and allow for generalisation, data were triangulated across all quantitative and qualitative data collection tools, in order to build consensus on the findings.

Target communities and people met

Only villages that had participated in the 2015-2017 WASH project were involved in the study.

12 **communities** were visited, approximately 3 per day. Three visits per day make it possible to meet more people in the same community or spend more time with specific people or groups of people. Each visit included:

- Completion of a structured pump checklist, developed to guide the assessment of each pump and its potential for sustainability.
- Completion of a sanitation and hygiene checklist for each household.

- Interviews and discussions will be held with key informants and other stakeholders - structured using an aide memoire.

The people met at community level were identified by**:**

- **Age** – children, adolescents, older people
- **Gender** – both women and men
- **Ability** – people with disabilities
- **Income** –this included: extreme poor; widows; child or grandparent headed households; single women or women headed households; migrant labourers
- **Living in geographically vulnerable contexts** – such as remote or difficult terrain

It was possible to meet the following people as part of this visit:

	Activity	Approx. Total
Water Works staff	Meetings	4
Health Surveillance Assistants	Meetings	10
Environmental Health Officer	Meetings	1
Well digger	Meetings	2
Area Pump Mechanics	Meetings	3
KIIs with external stakeholders	Meetings	2
Village Chief	Meetings + HH visits	3
Water Committee	Meetings + HH visits	12
Men villagers	Meetings + HH visits	60
Women villagers	Meetings + HH visits	240
Child (5-18 years) – includes adolescent girls	Meetings	10
Older person (>50)	Meetings + HH visits	10
Persons with disabilities	Meetings + HH visits	5
Carer of person with disabilities	Meetings + HH visits	1
Grandmother-headed household	Meetings + HH visits	3

More detail on the criteria for the community visits – as well as the methodologies for data collection - is provided in the Annex. In terms of villages visited the following categories were included:

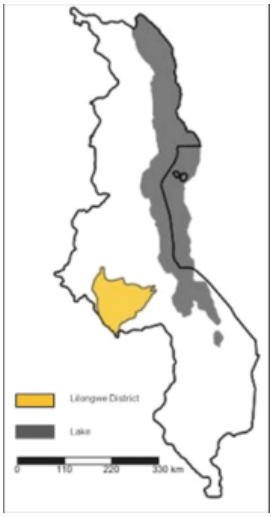
	Included
Villages visited	12
Range of water point technologies	
Afridev	1
Rope and Washer Pump	9
Alinafe Pump	2
Successful / unsuccessful since ODF	
Verified ODF	Yes
Verified ODF but slippage observed	Yes
Interesting good practice - Variety of water points/latrines constructed	
Varying social backgrounds / contexts - People of different backgrounds / contexts	Yes
Extreme poverty - Communities far from road	Yes
Particularly challenging contexts - Sandy soils	Yes

Limitation of the evaluation

The following table provides an overview of the limitations for the consultancy and possible mitigating measures.

	Limitation	Mitigating measure
1	Only a sample of communities will be visited	Information will be gathered through a range of channels including remote KIIs, a document review and discussions with Water Works staff will be used to understand the generalizability of the information. Communities will be selected for visits on the basis of a set of criteria to ensure a range of experience is assessed.
2	Not speaking Chichewa	The work will be prepared and undertaken in English. Where required materials and interviews will then be translated.
3	Limited documentation available on the project	Utilise different sources of information for triangulation of findings, including review of documentation, KIIs and field visits.
4	Nervousness around evaluation	This exercise is intended to be a joint experience and a positive exercise to: a. Learn together about what has been working well and what have been the challenges / gaps. b. To be able to make recommendations to support the work that they do and improve outcomes for the communities they work in. c. Give opportunities for comments to be made anonymously

Context



Lilongwe district is in the central plateau area. The majority of the people in the district are Chewas. Illiteracy levels are high (40%). Agricultural production predominates. In the Chitedze Health Centre catchment area, there are 146 villages with 9,916 households and a population of 53,154. Just 20% have access to safe drinking water and over half do not have latrines. Washing hands with soap or ash is seldom practiced.

Malawi met the MDG target for drinking water (with 90% of the total population using an improved water source) but only made moderate progress towards the MDG target for sanitation, with 41% of the total population using improved sanitation and 4% open defecation in 2015 (JMP, 2015[2]). Annex A shows progress towards the Sustainable Development Goals. The Government of Malawi has set a legal and policy framework for WASH. The Water Resources Act (GoM, 2013) and the Waterworks Act (GoM, 1995) provide the regulatory framework for water resources, supply and sanitation in Malawi. The National Water Policy (GoM, 2008) promotes an integrated approach to water resource management. The National Sanitation Policy (GoM, 2008) is supported by a National ODF Strategy (2011-2017). Stakeholders are currently updating the ODF Malawi Strategy.

"To be in line with the national policy, the zero-subsidy approach shall be adopted and applied by all implementers except for the case of vulnerable people, who shall need to be given subsidies after attaining ODF status in their area. The NGOs that are still providing hardware subsidies for latrine construction shall be called for a sensitization meeting and advised to stop providing subsidies, as this

[2] UNICEF and World Health Organization 2015**.** Progress on sanitation and drinking water – 2015 update and MDG assessment.

is not only against policy but also stymies private sector growth. The less damaging way to use subsidies after being declared ODF includes identifying the vulnerable people in communities"

The MoIWD has the responsibility to regulate, monitor, and disseminate information on water resources and sanitation. Local governments are responsible for planning and coordination of the implementation of water supply and sanitation at the district level. The Ministry of Local Government and Rural Development (MoLGRD) is responsible for implementing the decentralization of the WSS sector. Donors supporting the WASH interventions in Malawi include DFID, African Development Bank, UNICEF, European Union and several NGOs including WaterAid, Care Malawi, Concern Universal, Water for People and Malawi Red Cross.

Malawi	**Drinking water**			**Sanitation**			**Hygiene**		
	National*	Rural*	Urban*	National*	Rural*	Urban*	National	Rural	Urban
	2015	2015	2015	2015	2015	2015	2015	2015	2015
Safely managed	-	-	-	-	-	-	-	-	-
Basic service	67	63	87	44	43	49	10	8	18
Limited service	20	22	9	23	20	38	75	75	76
Unimproved	10	12	4	27	30	12	-	-	-
No service	3	3	0	6	7	2	15	17	7

Source: WHO/UNICEF JMP (2017)
*No safely managed estimate available

Water Works

Team structure

The team consists of a senior pump technician, team leader, programmed manager, project officer, - during the construction phase Water Works employs addition workers – assistant builder and assistant pump technician. Construction is done by 2 teams led By Water Works senior builders – with 2 assistant builders – they spend 3 weeks in each village – up to 4 weeks if the village is big. Water Works then pays cash for work for a further 2 weeks to complete the building of the latrine housing. The extended team includes Health Surveillance Assistants and well diggers

	Role	Responsibility
The Water Works Team	**Programme Manager**	Represent Water Works at WASH sector meetings; manage and motivate the Malawian Water Works team; oversee the project implementation to ensure that targets are met, the technical quality is high and the social aspects (mainly community participation) are followed; monitor and evaluate projects and write reports
	Project Assistant	Mobilise the communities; oversee overall project implementation ensuring high standards are met; provide administrative support to the programme manager; perform monitoring and evaluation
	Technical Expert	Train the communities to install, manage and maintain the Water Works Alinafe hand pump; provide continious support to the communties including a hand pump repair service
	Builders (+ temporary workers)	Support the communities to meet their water, sanitation and hygiene related goals including the construction of wells, latrines and hand washing systems, ensuring that the technical quality is to the highest standard
Ministry of Health Team	**Deputy District Environmental Health Officer**	Support and coordinate the project with the Water Works Programme Manager; ensure that projects are implemented to a high standard and are in line with Malawi's strategies; liaise with the Ministry of Water and Ministry of Health; represent the partnership and promote Water Works within the WASH sector.
	Assistant Environment Health Officer	Make available and coordinate the Health Surveillance Assistants; monitor project implementation ensure that the project is implemented according to the project work plan and to the highest standards; provide support and training to HSAs where required

	Health Surveillance Assistants	Implement the CLTS and PHAST awareness programme in accordance with the project work plan; provide constant support to communities to address and improve water, sanitation and hygiene practices; perform monitoring and evaluation

HSAs whose catchment village falls under the Water Works project receive a 3-day training course from the Water Works staff on the hygiene methodology, CLTS and PHAST, usually 6 HSAs are trained a year. HSAs receive an allowance of 8.5 days for their support to Water Works – at 5,000 KW a day. This includes

- 1 day to perform the project baselines
- 1/2 day to perform the project endline
- 1 to attend the celebration
- 6 days for the training Water Works provides

The EHO also receives an allowance for supervision and Water Works have reproduced the manuals for PHAST with its series of 7 steps with 17 activities on the faecal oral diseases, analyze their own hygiene behaviors, and plan how to block transmission routes, the manual as well as laminated pictures for the HSAs to use as training aid with villagers. HSAs should be delivering the trainings to all households, to include women/ men/ elderly/ disabled/ young parents, as long as they are capable of coming to the sessions.

Wells are dug so that they have at least 3 metres of water in them – with help of the community. Water Works team constructs the concrete rings, lines the wells, constructs the well surround.

Well diggers work in pairs of two: they are paid on outputs (the completion of a well). The payment is divided 50/50 between the 2 diggers. If one well digger works harder than their partner he receives the same payment. The well diggers are loaned a bike to help them reach the work sites and move between locations – however the bikes need frequent repairs perhaps if they were gifted to the diggers/builders they might look after them better. There are no female well diggers. Well diggers receive a helmet but no other protective clothing.

Project and approach

The Theory of Change centres on reducing the incidence of diarrhea by introducing comprehensive hygiene awareness sessions to motivate the villagers to want to change their behavior with improved water and sanitation facilities. Water Works have a partnership agreement with the MoH District Health Centre in Chitedze – a service agreement that sets out the services to be provided with the objective of reducing diarrhea in 50 villages in Chitedze in TA of Malili.

Village selection was done by the Water Works project officer and Environmental Health Officer (EHO) from Chitedze Health Centre. The communities were selected based on the lack of access to potable water, poor standard and low coverage of sanitation, high community demand and willingness to contribute and take ownership. There is a meeting with the Chiefs where the project is presented and the Chiefs can approve to work in their village.

HSAs, with the support from Chitedze Health Centres, mobilize communities to address and improve the WASH behaviours through the application of CLTS and PHAST. Water Works supports the communities with the construction of the water point, latrines and handwashing systems

The project is delivered over an intensive 7 weeks: the villagers have hygiene awareness training, build their own latrines and water point, learn how to repair the pump, and set up a committee to collect funds for O&M. The project was implemented in 2015-2017 with 10 villages in 2015 and 20 villages in 2016 and 2017. The working year starts in April and stops in Dec/January (i.e. 9 months).

Communities contribute 500 KW per household (but 700KW in 2017-18) as part of their contribution to the project. The money is used to subsidize the water point repair service – the 1 Year Guarantee. Households receive a latrine slab, plastic sheeting for the latrine roof, plastic bottle for handwashing station and a bar of soap.

Monitoring

HSAs have a role in the routine data collection. HSAs perform a household survey before the project starts (a sample of 1 in 3 households) and the survey is repeated 1 month after the completion of construction to evaluate the change. Water tests are also being taken. The monitoring information will be available for all stakeholders to view as it will be mapped online by linking Microsoft Excel to Google earth. The HSAs facilitate the community to produce a community map identifying the households with and without latrines and hand washing systems, which the community will update, although most of the ones seen were illegible or lost. HSAs monitoring includes a household visit once a month. Water Works collects a case study on the life of a villager to document stories of Most Significant Change.

Water Works collect data on a) disadvantaged groups; b) slippage; c) maintained hand-washing practice. The Village Level Planning, Monitoring and Evaluation Form includes the number of vulnerable households – incudes single women parent headed household, child headed household, elderly headed household without carers, household with someone that is severely disabled, household with someone who is chronically sick, household that never earns any income.

Overview of learning against key learning themes - water supply

A physical inspection of the water points, apron and drainage channel was carried out to assess the quality or suitability of the facility through completion of a checklist. Communities and Water Committees were involved during the inspection. The checklists revealed consistent findings across the villages.

Summary of the Pump Structured Checklist

Criteria	**Typical response**
Number of households using the pump	18 Chikahawo; 19 Galundani; 22 Kwayera; 55 Hencok; 23 Malioti; 75 Mvume; 28 – Mbalawakuda; 45 – Kwama (Kwama split into 2 villages Kwama + Umpanda village)
Time to collect water + queuing time	15-30 mins
Who collects the water	Women
Pump, water quality and quantity	
Pumping	Easy
Water discharge	OK/ (very little in dry season in Kwayera)
Resource reliability	Throughout the year; seasonal failure in Kwayera
PVC parts	OK
Rope	Quality- OK; tension- OK; connection – OK; grip on wheel - OK
Technical functionality	All mechanically functional and being used
Structure	Welding – OK; Painting – OK; Rust – No; Axle – OK; Handle – OK; Grip lock – OK; Height of handle – OK; Wheel – OK
Number of breakdowns	0; 2 (rope broke – Mvume; Malioti)
Typical time to fix breakdown	Same day
Area around the pump	Typically clean apron, good protective fencing, and soak away – except in Kwayera, Malioti, Galundani and Malioti
Water taste	Good; bad (Galundani – rusty water)
Turbidity	Clear; Cloudy in Mbalawakuda; Kwama

When was the last water quality test taken	September, October, November
Management assessment	
Water point committee	Manages finance and maintenance
Women on the committee	50% or more are women; women have key leadership positions
Water payment	Monthly household contribution (lock pump when no payment e.g. Kwayera; Henock)
Fee collection	Special arrangements for the disadvantaged
Do you know who your area mechanic is?	Yes
Ability of water committee to carry out repairs	Either no repairs necessary or repairs have been carried out to a high standard. In Kauma and Mvemve repairs have been carried out but not to a high standard
Ability to access spare parts	In short
Access to external support for O&M	Assistance is available
Training	Women trained
Training for the committee	Immediately after pump construction
Type of training	Routine maintenance and minor repairs

Shallow well location and construction

The Village Chief and community identify the well to be protected or newly built - it must be 30m away from a latrine. No hydrogeological method was used for locating the wells. Rope and Washer pump and the Alinafe pump are installed (neither are approved handpump technologies by Government of Malawi).

The wells are up to 10 metres deep and the water is typically at a depth of 3 or 4 metres before Water Works will install a pump. A submersible water pump and generators are used to empty the well of water prior to digging. Concrete rings are used to line the wells (to prevent well collapse). Water Works has 4 concrete ring moulds, usually 12 rings per week are made for wells and rehabilitation of old wells. Water Works team wait for the high-water tables to go down enough for our digging teams to dig to 3m. Wells may need to be dug deeper which is more difficult when the pump has been installed (although it does happen).

Some communities reported low yield in the dry season, which could indicate improper location of the well or else that the well is not sufficiently deep. The risk that the relatively low amounts of water likely to be available may mean fewer people use the wells than proposed or derive less benefit than expected. Some communities reported that an existing open well was deepened for the Water Work pump – but that the open well also went dry previously.

Rope and Washer pumps are normally designed to serve around 20 families. In some instances, large communities (and neighboring communities) are using the pump. More users than the design capacity will negatively influence the lifespan, although no significant relationship was found between the frequency of breakdowns and population served in the communities visited.

Hand dug well construction is an inherently dangerous activity with the potential for well collapse, lack of air circulation to diggers and falling objects. The only safety equipment mentioned is hard hats, other protective equipment is necessary.

Households reported using the well as the main source of water for drinking, hand washing and cooking. Some communities were still using open wells for washing or laundry.

		
Chikhawo	Kwayera	Chikhawo (put out of use)
Examples of open wells		

Functionality of pumps

A survey to assess the functionality of the 56 water points installed previous was first performed in June 2016. As part of the water point repair service requires surveying all of the 64 water points previously installed and retraining the water committees in the repair service – plan for setting up the water point repair service. The survey showed that 34 out of 64 pumps are functioning. 9 from 2015, 19 from 2016.

All pumps inspected were in good working order: communities visited used the Rope and Washer pump and the Alinafe pump in addition to one using an Afridev that was brought back into use.

	
Henock	Galundani
Rope and Washer pump	Alinafe pump

For the Rope and Washer pump, minor breakdowns were relatively common involving displacement of the rope but this issue was easily and quickly resolved by the users. Where communities made repairs to the Rope and Washer pump themselves –all reported fixing it the same day and confirmed the availability of spare parts. The Water Committees knew where to get technical assistance for more advanced repairs, but suggested a reliance or dependency on Water Works. Communities were able to collect funds for maintenance and minor repairs. Water Committees talked about regular rope wear inspections such as checking the tightness of the rope. They also check the wheel and handle for proper lubrication. There were some cases of incompetent repair that have the potential to contaminate water – these were made by the community or Water Works.

The Alinafe pump is more difficult to maintain despite being built with low cost materials that can be found at local markets. Communities and Area Pump Mechanics found the pump difficult to use and maintain. Communities visited asked for the Alinafe pump to be replaced with the rope pump. The Water Works pump repair service could expand into pump sales to sell Rope and Washer pumps to communities, but it depends on whether communities are able to pay. Water Works had gone to 8 pre-2015 villages to ask if they could raise 1000mwk/HH (the cost of a new rope pump is about 71,000 MWK excluding installation) to pay for a new Rope pump and no villages were capable, although 3 villages showed a lot of interest.

	
Kauma	Mvemve
Examples of incompetent repairs	

Condition of the water points

The areas around the water points were clean and tidy. The construction of soakaway pit varied – most had built one but the quality varied in their effectiveness in preventing pooling of water. The construction of the apron is also important in achieving improved water quality. The apron around the well was in a reasonable condition in most cases and the apron was raised sufficiently to provide protection from storm/surface water. Some aprons had cracks in the concrete platform, which could lead to contamination of the well. Some also had cracks in the drainage channel or standing water, perhaps due to improper construction so that the water doesn't drain properly i.e. poor quality cement mix and/or settlement of the ground after construction or the use of quarry dust instead of sand. Cracks in the side of the apron, poor drainage and maintenance are a direct pathway for contaminants to enter the source. All but one of the water points had well-constructed fences to protect them from animals, although children are often reported to break the fences.

	
Kwayera	Galundani
Examples of inadequate soakaway pits	
	
Malioti	Malioti
Examples of standing water in the drainage channel	
	
Chikhawo	Mvemve
Good examples of fences around the handpump	

The laundry stands costs around £5 to construct. It is a standard component of the project. Some communities reported they had banned the use of the laundry stands because of improper use – other communities claimed to use them. One community by a river reported still going down to the river to wash (despite the risk of schistosomiasis) because they were too 'lazy' to pump the water. Some women were seen washing clothes in basins by their homes. Water Works could consider building them on a demand-led basis in future.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Mvemve</td><td>Mwakhundi</td></tr>
<tr><td colspan="2">Examples of use of laundry stations</td></tr>
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Water quality

The Malawi Standards Board (MSB) recommends that shallow wells should be sited at a distance of no less than 100 m from sources of pollution, including latrines, septic tanks, refuse dumps, cattle kraals, dip tanks and cemeteries (MSB, 2005). The World Health Organization (1997) and the Malawian Ministry of Irrigation and Water Development (MIWD), have suggested minimum distances of 30 m and 50 m, respectively. The majority of Water Works samples seen in the evaluation fall within the MSB guideline maximum value for rural water supplies of 50 CFU per 100 ml during the wet season. However, water points with >20 CFU are re-chlorinated. Water Works are also considering promotion of Safi water filters[3] to improve point of use water quality.

Standard drinking water quality values

Standard	Faecal coliforms (CFU/100 ml)	Turbidity (NTU)	Conductivity (ms)	TDS (mg/l)	pH
MSB, 2005	50	25	3500	2000	6.0-9.5
WHO, 2006	0	5	No guideline	1000	6.5-8.5

CFU= Colony Forming Units; NTU = Nephelometric Turbidity Units; micro Siemens; TDS = Total Dissolved Solids

Where shallow protected wells are well maintained, and not located close to latrines or animals, the choice of rope and washer pumps should not undermine drinking water quality. Inspection of the location of water points showed they had been sited to reduce the risk of faecal contamination and ensure water quality standards are met. However, shallow protected wells with poor sanitary scores (e.g., cracks in the base, visible pathways, etc.) are more likely to have levels of faecal contamination above the MSB safe level (≤50 CFU/100 ml) especially during the wet season. This requires further attention to construction and Water Safety Planning protocols.

[3] http://safiwater.com/

	
Mvemve	Chidelu
Ill-fitting inspection hatch	Cracks in the well apron

Water Works and the HSAs have certainly tried to promote the importance of water quality at point-of-use (i.e. the quality of the water when it is being consumed or swallowed) rather than simply measuring quality at the pump. HSAs are advocating treatments like boiling and filtering as well as distributing Water Guard or chlorine. There is little evidence from any of the discussions with the communities that this was happening at household level, although householders were aware of the water safe-water-chain (i.e. safe water storage and handling) and point-of-use of safe drinking water as well as improved sanitation and hygiene behaviour change. Some of the communities visited said their water sometimes tasted bad (this appeared linked to an iron problem on the rising main, which affected the taste, odour and appearance of water. The communities were told by Water Works to wipe down the rising pipe). Others said the water was cloudy and tasted different in the rainy season

	
Iron problem on rising main - Galundani	Cloudy/muddy water - Kauma

Overview of learning against key learning themes - sanitation and hygiene

A physical inspection of the latrines and handwashing facilities was carried out to assess the quality or suitability of the facility. Communities and Water Committees were involved during the inspection. A tally was used for keeping scores, percentages have been rounded. Again, the checklists revealed consistent findings across the villages.

Summary of the Sanitation and Hygiene Structured Checklist

	Yes	No
Does the household have a latrine?	100%	-
Does the toilet facility have a concrete slab?	100%	-
Is the facility shared with other HH?	5%	95%
Does the latrine smell?	15%	85%
Are there flies or insects?	15%	85%
Is the pit leaking?	-	100%
Does toilet facility have anal cleansing material / water available?	20%	80%
Does the superstructure give the user privacy?	95%	5%
Do HHs pay for the pit to be emptied	-	-
Is there a designated place to wash hands near the sanitation facility?	100%	
Is a hand cleansing agent such as soap or ash present?	70%	30%
Is there soap?	60%	40%
Do HH have soakaways for waste-water	-	100%
Is the facility adapted for people with special needs?	10%	90%
Where else do people go to defecate?	Family or neighbour's toilet. Cat method in the fields	
Does the household have a rubbish pit/means for disposal of solid waste?	5%	95%
Are bathing facilities present and functioning?	100%	
Is a dish rack present?	5%	95%
Are faeces visible in the community?		100%
When children are too young to use the latrine where do they defecate?	On the ground and mothers collect the faeces and dispose of them	

Hygiene awareness training

Water Works uses a hybrid CLTS and PHAST approach. Whereas CLTS focuses on eliminating open defecation and motivating people, PHAST provides awareness on improving latrine facilities (moving up the sanitation ladder), improving hygiene behaviours (particularly household water storage and use and environmental sanitation) with the emphasis on community planning.

Community-Led Total Sanitation is concerned with the achievement of open defecation-free communities and the crucial practice of handwashing with soap. A single day of 'triggering' and a number of post- triggering follow-up visits, where facilitators enter a community and, by using a selection of tried and tested techniques, elicit emotions such as shame, embarrassment and disgust from villagers as they realise that by practicing open defecation they are in essence eating each other's faeces. This revelation is designed to bring about a transformation in the community who vow to come up with a plan to stop open defecation, which usually involves the construction of temporary toilets from locally available resources

The "triggering" might involve a transect walk ("walk of shame") involves leading participants around their village and surrounding area to locate faeces resulting from open defecation. The faeces are brought back to the village and placed next to food where flies are observed moving between faeces and food. It is important that these decisions emerge from the community itself, rather than being imposed by the CLTS implementer.

The HSAs and EHO thought that the combination of PHAST and CLTS is effective for latrine options and construction, hygiene promotion, community ownership. The CLTS and PHAST Hygiene awareness takes 6 days – one day for the CLTS triggering and 5 for PHAST – although most people reported it taking 5 days (8am-2pm). Respondents were able to describe what happened during the training and list the topics covered. Although some people reported learning something new, for example how to clean a jerry can properly or why you should wash hands with soap. Some respondents said they didn't learned anything new in the training – and there was less evidence of them applying what was learned. This suggests the training was more 'teaching' or 'hygiene education' activities for rote learning, people were just to be able to remember what was taught. For instance, villagers said they had been taught that they must have a toilet. People did not seem to have had that light bulb moment when they understand the reason why they need to stop open defecation.

Water Works aims for attendance target of one third of the population (over the age of 5 attending). Since 2017, it has become mandatory for someone from all households to attend the sessions. Women and elders were reported to be the main attendees at CLTS triggering events and in PHAST groups, however they are not decision makers at household level for instance when men had migrated to South Africa for work, the wife couldn't make a decision on toilet till he returned.

Water Works provides supporting materials to the HSAs to help them deliver the training but some of the HSAs couldn't remember the content – it seemed like they were just repeating what was in the instructions. The quality of facilitation of the participatory activities with community groups is important. Water Works staff sit in on some of the training to support but it would be useful to evaluate the delivery of the training in communities by the HSAs and provide some testing and review to help revise and make improvements. Community members recall making the Community Map and the Transect Walk but not all remembered doing the 'shit or medical expenses calculations' or the contamination exercise, or the triggering handwashing exercise suggesting reduced fidelity to the training plan by the HSAa.

During the PHAST activity on 'Planning for Change' people decide who will be responsible for latrine construction (pits dug, sanitation platforms construction, drop hole covers, foundations constructed, installing the platforms, drop hole placed on slabs, houses made of mud bricks, latrine roof made, hand washing facilities, latrines for the vulnerable). On the last day of the PHAST training a Working Group is assigned for construction and water committee appointed with equal men and women – a Chair, Secretary and Treasurer. The community is responsible for cleaning, backfilling stagnant pools of water, fixing the fence, ensuring the pump is not vandalized) most had a rota for how often it should be cleaned.

	
Mvemve	Malioti

Examples of CLTS community maps

HSAs visits to communities approximately every month for follow up after the community is declared ODF (however this was very dependent on transportation and availability). Householders can recite the list of behaviours but in practice HSAs reported that people aren't consistently using the handwashing stations or caring for latrines. Results and impact are highly dependent on HSA motivation and activeness: the HSA for Kauma had been transferred to another catchment area, which explains some of the slippage observed. Other HSAs were supporting households in a progression towards a 'healthy home' and ODF ++ with a focus on food hygiene, bathing children, solid waste disposal, penning animals and surface drainage.

	]
Mvemve	Chikhawo
	
Mvemve	Chikhawo
Evidence of elements of a healthy home	

Households had a bathhouse for body washing –some had buckets and soap as well as toothbrushes inside – most were private but a few had holes in the brickwork or low walls that would permit others to see in. Anecdotally bathhouses are used for urination. Water logging around the bathhouses was fairly common indicating the need for soakaway pits and surface drainage. Although not currently part of the Water Works projects, this could be addressed through a future focus on 'healthy homes'.



Mvemve	Mvemve	
Examples of poor drainage from bathhouses		

Handwashing station construction

Water Works provide the materials for tippy tap construction – 5-liter bottle and soap. Most households visited had a tippy tap but a few used a basin that was stored in their bathhouse (distributed by Water Works prior to the 5-litre bottle). A shared bucket for dipping hands is not considered an effective handwashing facility. Most handwashing facilities were in a good condition, some had innovated in the design. A few liter bottles were cracked because they had not been used (and cracked in the sun). Most households had soap or ash available.



Chidelu	Chikhawo	Chikhawo



Chikhawo	Kwayera	Chidelu
Positive (and a negative) examples of handwashing stations		

Latrine construction

Latrine construction is the community responsibility and included in the Action Plans communities developed through CLTS and PHAST training. Usually latrines are constructed in a 3-week period after the hygiene training while the Water Works team works in the village. Households are provided with plastic sheets for the roof. Households pay 700 KW for the latrine slab, previously this was 500KW (although this covers the 1 year guarantee period for their water point).

A slow pace of construction of the latrines was reported in some communities, because not all households participate. Some households wait for the Water Works building team to do the construction or pay another villager to do it. Intervention by the Village Chief is sometimes needed to expedite construction where communities are not participating. The Water Works team does the construction for the vulnerable households. Water Works also offers cash for work in a 2-week period, for community members to ensure that all construction is completed.

A number of very well constructed, maintained and decorated latrines were seen in the communities visited. There was evidence of the latrines being used and no sign of open defecation in any of the communities visited.

Kwayera

Mvemve

Mvemve

Kwayera

Kwayera

A latrine for a polygamous household in Kwayera

Good examples of latrines

Inspection revealed some issue with the roofs and slabs and latrine covers (to be discussed later). In Mwakhundi 4 of the slabs had crumbled, a householder thought they were built on the same day and not enough cement was used in the mix (perhaps linked to inflation and its impact on cost of cement) **but** Water Works thought it was more likely due to soft ground conditions, i.e. higher sand and lower clay content in the soil. Since no other slabs have broken due to a lower cement content in the concrete mix.

Cracked latrine slabs

There were many examples where the latrine cover didn't fit the hole.



Examples of ill-fitting drophole covers

Example of a latrine sited behind the bathhouse, with a very narrow latrine doorway, Henock

Crumbling latrine entrances

There could be further options for latrine design. There is a lack of consultation and involvement of community in decisions on latrine technology options and slab type. Further options are required for improving accessible designs; basic technical guidance can be provided without undermining CLTS community led processes.

Some guidance on basic improvements such as ring beams or lining tops portions of pits has been provided to reduce the risk of collapse in villages with sandy soils - In Kwayera (2017 village) the top 500mm of the latrine was lined with fired bricks.

Some latrines had very narrow entrances. Water Works build the housing with a representative for the HH (or they build the housing themselves) so households decide what sort of entrances they'd like. A particular area of innovation is on doors for the latrines. Some toilets had a reed door + others had plastic sack to provide more privacy. Promoting a simple tying systems for sacking flaps or door design would be helpful.

		
Chikhawo	Chikhawo	Mvemve
		
Chikhawo	Chikhawo	Chikhawo
Examples of latrine doors		

There are a range of ways that Water Works has supported vulnerable people and households to gain access to and use latrines and hand-washing facilities; including in some cases constructing the facilities themselves. The Needs Assessment relies on Water Works identification of vulnerable individuals. There is a one size fits all response: people aren't asked what they want or if they need it. There are instances where this excludes other household members - grandmother looking after child and the child can't easily use a raised seat. See Annex for examples. Other arrangements are needed for people who have challenges of getting to the latrine [examples of commode chair and screen] or have difficultly going at night. Innovation in the pedestal design would be useful, not all household members can use the raised latrine – meaning some share with neighbours or other family members. The Environmental Health Officer appreciated the subsidy, noting that it is very difficult to find money to build a toilet when people go to sleep without eating.

Innovation was seen in the latrine doors, privacy screen in front of the door (see photo below) the drop hole covers, the handwashing stations – and these had been replicated within the villages (i.e. localized) but not in the wider Water Works project area – there is further scope for exchange visits or sharing the learning between villages.

	
Galundani	Chikhawo
Examples of privacy screens	

ODF status

Malawi has adopted the CLTS, which encourage the construction of low-cost sanitation facilities using locally available materials and self-help labour. Malawi's National ODF Strategy refers to:

- *Level 1 - ODF:* Every household uses a latrine with privacy, there is no shit in the bush (i.e. 95% of houses have latrines; 5% can share)
- *Level 2 - ODF ++*: Every household has a latrine with cover and hand washing facility (100% coverage, sharing is acceptable)*;* all religious institutions, market centres and health centres in the catchment area have latrines with covers and hand washing facilities (100% coverage)

ODF status requires that every house has a latrine that is in a good state of repair, privacy, roof, tightly fitting drophole cover, safe faecal disposal for children, a handwashing systems with soap and ash and that there are no signs of OD. Water Works focuses on Level 1 ODF. Once latrine construction is completed and ODF is verified, the project villages receive a certificate from Water Works. There is a celebration (partly paid by Water Works - communities receive 10,000 KW to cover the costs). The Chiefs and representatives from other villages, as well as HSAs and EHO, come to the celebration to celebrate the achievements of the village in the hope it inspires other villages. Follow-up checks by the HSAs are conducted a number of times each year for the certified villages to ensure that the ODF status is maintained. Community has initiated forms of "penalty" for open defecation in some areas (e.g. bringing people to Chief etc.) Some communities reported sanctions and by-laws were in place to stop ODF.

	
Community Map - Malioti	Community ODF Certificate - Kauma

Use of latrines + sharing

The latrines inspected showed evidence of use including availability of material for anal cleaning such as paper. There was no evidence of open defecation in the communities visited. Importantly, all vulnerable people now had access to a latrine. And new people that moved into a community said they were told they had to build a latrine.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Galundani</td><td>Henock</td></tr>
<tr><td colspan="2">Anal cleansing material available in the latrine</td></tr>
</table>

Some communities said there is no sharing. Other households reported sharing with neighbours or family members (the national policy allows for 5% of the community sharing**).** Sharing was most common if the toilet had an accessible latrine (i.e. which prevented some family members for using it such as children). Some people said they only share during rainy season if their unimproved latrine collapsed. Customs prevent parents sharing with the daughter in law. Polygamous households had more than one latrine. Most respondents said they wouldn't let a stranger or passerby use their latrine.

Evidence of children's faeces management was in practice: for children that cannot use a latrine the parents report using a hoe to pick up the child's shit and put it in a latrine or bury it. Children (10-16 years) generally said they weren't frightened to use the latrine. They had knowledge of hand-washing after toilet and before eating but said they were not always able to practice if they don't have access to handwashing facilities

Some households have unimproved latrines – these were often just a pit with wood across the top. Termites are reported to be a problem and many community members were afraid of falling into the pit especially in the rainy season.

		
Mvemve	Wakuda	Galundani
		
Mvembve	Mvemve	Kwama
Unimproved latrines still in use		

Water Work's 'integrated approach' and provision of a subsidy means that some households have 2 latrines – the household didn't demolish the unimproved latrine but built the new latrine alongside it. They reportedly continue to use it until the pit is full. Their new latrines are locked. Or else the household uses the unimproved latrine in the dry season and improved latrine in the wet season (for fear the floor of the unimproved latrine might collapse in the rainy season). The lack of space for households to have 2 latrines has led to conflict in some communities**.**

Some latrines are locked or closed – because the household is using the old latrine, or else to keep goats out of the latrine or to stop children using them. Some households lock their latrine when they are away from home.

	
Kauma	Mvemve
	
Kwayera	Kwayera
Examples of closed or locked latrines	

Condition of latrines and slippage

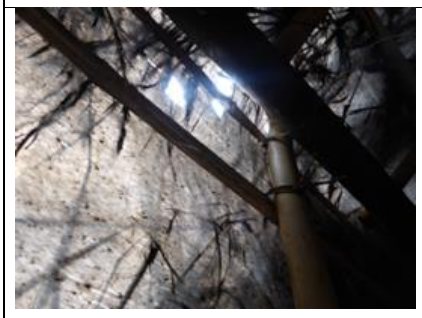
The majority of toilets seen were clean, without smell, no shit on the drop hole, no flies but appear to be used. Some people stored ash inside the superstructure to cover the shit as a way to stop the smell (advice from their HSA). Women were the one who reported cleaning toilets; children sometimes.

Some toilets did not have drop hole covers –reported to be stolen by families who didn't have them, or else taken by children. Some of the earlier wooden models were taken for firewood and some had broken. Water Works and households had innovated in the design of the cover. Some households had attached a cord to the latrine hole cover to make it easier to lift without bending as well as to ensure the cover doesn't fall into the pit. As noted earlier not all the covers tightly fitted the drophole.

		
Galundani	Galundani	Galundani
		
Mvemve	Kwayera	Kwayera
Examples of drophole covers		

In some communities, a number of latrines lacked roofs and non-durable latrine superstructure materials (soft wood eaten by termites, weak grass or mud walls which cannot withstand wind and rain) led to latrines becoming quickly dilapidated. This discourages people from repairing or reconstructing latrines in the future. Water Works has tried to encourage householders to re-roof their latrines but as they don't even have enough money to roof their main houses, there has been little success.

Galundani	Mwakhundi
	
	Kauma
	
Mvemve	Mwakhundi
Examples of poor roofing on latrines	

There was evidence of slippage in the communities visited. For instance, a whirlwind took the roof off latrines in Mwakhundi several weeks previously and these hadn't been rebuilt. There is some evidence of dependence on Water Works and demotivation. Collapsing latrines and the need to rebuild them was an issue that came up in areas of sandy soils. Respondents reported using a neighbours latrine if their latrine has collapsed after flooding – before having to rebuild them. Households also reported using the 'cat method' for burying faeces or else constructing a shallow latrine. There is additional difficulty for disadvantaged who need help to construct latrine – as they have to wait for someone to support them each time their latrine collapses. There are opportunities for further innovation in the latrines e.g. brick domes for sandy soils, basket lining, more comfortable pedestals, corbelled latrine. Innovation in the raised seat design would be useful, not all household members can use the raised latrine – meaning some share with neighbours or other family members.

Moving up sanitation ladder

Given that most households have a good quality latrine, unsurprisingly there wasn't much evidence that households are moving up the sanitation ladder. Few self-initiated latrine adaptations were observed. Aspects of sanitation marketing could be explored and incorporated into future WASH project design. Efforts are currently geared toward strengthening local supply chains of sanitation and hygiene items as done in Mpingu, as well as establishing and building relationships between communities and sanitation suppliers such as supporting mason training. There are plans to bring on CFWs, ideally these are workers that would be full-time masons. Roofing and interventions to further improve privacy may be something to encourage as part of the sanitation marketing.

	
Henock	Chidelu
Negative examples of innovation in design, where the householder had inserted a hose in the pit, with the intention to eventually attach some kind of funnel so that grey water from a handwashing station could be drained into the pit – as a consequence the toilets smelt and had a large number of flies	

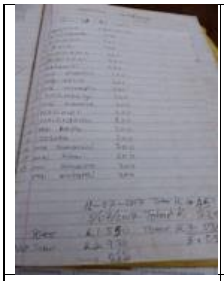
Overview of learning against key learning themes - management

Water committees

Water Works trains the village Water Committee on maintenance following the installation of the water points. The committee is trained on a community collection system, payments and balances accounts and account keeping. The committees meet monthly to collect water user fees, perform any outstanding activities that are required to maintain the pump. The committee keep a log of the fees collected, preventative and reparative maintenance performed and any difficulties faced. Communities are provided with cash boxes, accounting books and calculators (in some cases). The person who keeps the key to the box is different from the person who keeps the box. The rate per household varies – some households pay 100 – 200 KW. Most households pay 150 KW a month. A number of people do piece work to earn the money to pay into the collection system, either as a household or a whole community. All households except the vulnerable pay. The elderly and people without an income are usually those exempted. Communities have decided that if a household doesn't pay for water then the pump will be locked and they won't be able to collect water (other households have the inconvenience of collecting the key from the committee). This a tactic that Water Works have used if communities don't meet their obligations once the pump is installed i.e. building the fence or the soakaway pit. This has been successful although could potentially undermine community ownership.

Some communities make loans with the money collected and interest charged – there are instances where loans haven't been repaid. One example where the chief borrowed nearly all the savings to pay for funeral transport – which hasn't been repaid. The community refused to continue to pay into the collection system.

The committee pay for the pump to be repaired (by an Area Mechanic for example) after the 1 Year Guarantee period is over or pay Water Works to fix it (Water Works charges 5,000 KW + parts).

		
Community accounting books	Example of a 1 Year Guarantee, Kauma	Community accounting books

Small scale private sector management

Area mechanics working with Baseda/InterAide have gained the technical skills to carry out repairs on Water Works pumps and in turn they trained Water Works staff on the Afridev. Three who were involved in Water Works repair scheme were interviewed – they were happy with their jobs but revealed they could not make a living from being a pump mechanic. All were farmers. They advertise their services with leaflets in the community and leaving their phone numbers with the Water Committees and ADCs as well as shops that provide spare parts. The Area Mechanics go to a community and provide a quote for the repair. The mechanic tells the villagers the parts they need to get for the repair and then the community call them when they are ready. They complained about nonpaying or late-paying customers. Area mechanics felt that they were competent to do all repairs on all types of pumps. The main reasons for non-functionality were the technology choice (Afridevs) or that major repairs were required. The mechanics preferred the technologies used by Water Works and said that training sessions on the Rope and Washer pump should continue on a regular basis into the future, because some area mechanics might move away to the towns or else they forgot the skills learned if they aren't used (i.e. because communities rely on Water Works for repairs in the 1 year Guarantee Period). As Baseda are planning to exit from Lilongwe district, Water Works will need to establish direct links with the existing area pump mechanisms.

Spare parts

Nearly all respondents and area mechanics knew where to get the parts. Spare parts are available at low costs from nearby local market. A shop in Mpingu stocks spare parts like rope. (see photo of shop owner holding rope).

Findings

Impact

The project had been designed with careful consideration to level of needs, project areas, logistical realities and cost implications. The project has a manageable spread of work but in a big enough geographical area to support the potential for learning. The project areas were selected by EHOs and Water Works according to where greatest impact can be achieved. The communities identified were those without improved water supplies and sanitation, some communities had open wells and some

households had unimproved latrines. Follow up and monitoring of project activities was facilitated by increased logistical capacity (the vehicle) and fairly compact project sites. Water Works has demonstrated attention to equity through geographical targeting at country level, equity sensitivity of activities and equity-lens in M&E systems.

Safe water, effective sanitation and hygiene are critical to health. The majority of water and sanitation facilities observed in Water Works villages could be expected to contribute towards healthy communities. In particular, Water Works aims to reduce diarrhoeal morbidity and mortality. The KAP survey asks:

- How many people in your family have died due to water or sanitation borne / diarrhoea disease (in the last 5 years)?
- During the past 2 weeks, has any members of your family had diarrhoea?

The question on diarrhea is designed to capture a 2-week recall of diarrhea. Although this period is used in standard surveys, recent literature casts doubt that recall of up to 2 weeks accurately captures both current and past episodes. Long recall periods may underestimate milder diarrhea cases by approximately 40% and more severe cases by approximately 20%[4]. Thus, it is recommended that the KAP survey is changed in favour of a shorter recall period (3 days) to more accurately capture diarrhea severity and duration. And a definition[5] should be added: without a standard definition, the informants' own definition of diarrhea is a significant contribution to results. The data on diarrhea collected from the Health Centre is also inconclusive (indicating winter and summer peaks in diarrhea. HSAs report that diarrhea has decreased in the project areas, yet self-report or parent-reported diarrhea is an unreliable method to estimate the incidence of diarrhea. For these reasons, it is also recommended that reducing the incidence of diarrhea is not identified as primary to the project Theory of Change. The mortality question may be impossible to gain accurate data on, it is suggested this is deleted.

Data from the Health Centre indicated that urinary schistosomiasis and under-5 Pneumonia are common in the project areas. HSAs have been working hard to keep communities motivated to maintain sanitation and hygiene practices. HSAs reported that the project has had an impact on reducing schistosomiasis in some communities. HSAs include hygiene promotion messages on reducing contact with infested water on domestic work (collecting water, washing, dish washing, clothes washing) and recreational use (swimming, playing in the water) as well as occupational use of water (fishing, crop irrigation, car/bike washing, cattle herders). By building laundry facilities Water Works has helped reduce potential contact with infested water. Solar water disinfection, chlorination or a water storage tank are additional ways to remove cercariae from water. Hygiene promotion messages around urination might also be effective since urogenital SCH is most prevalent in the project areas. Hygiene messaging targeting ringworm and handwashing messaging for respiratory infections could be improved since both appeared common in the children in the communities visited. The health impact of Water Works could be further improved through a focus on achieving 'healthy homes' and 'healthy communities' (see the section on Effectiveness).

[4] Fischer Walker CL, Fontaine O, Black RE (2013) Measuring Coverage in MNCH: Current Indicators for Measuring Coverage of Diarrhea Treatment Interventions and Opportunities for Improvement. PLoS Med 10(5): e1001385. https://doi.org/10.1371/journal.pmed.1001385
http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001385

[5] Diarrhoea is defined as the passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual). http://www.who.int/mediacentre/factsheets/fs330/en/

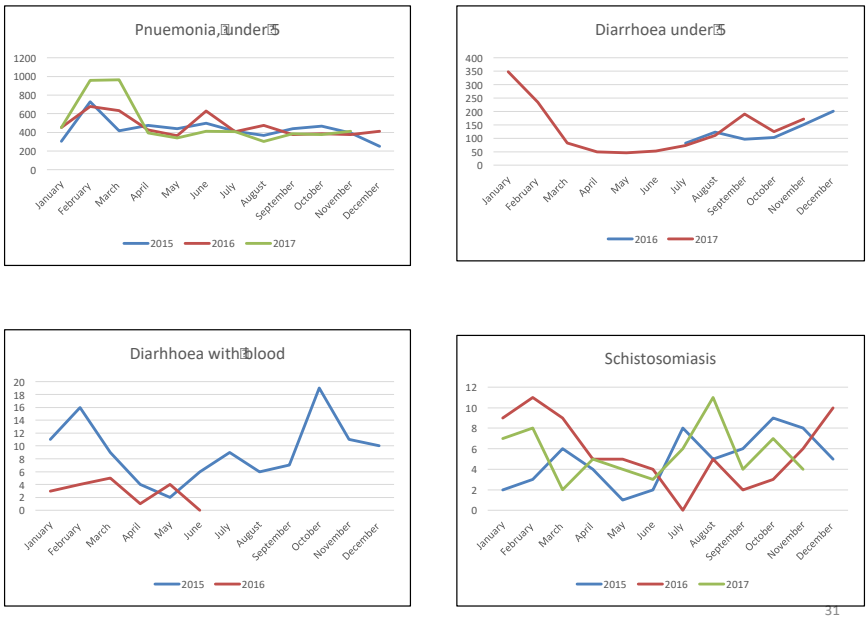


Figure: Constructed from district health data collected from Chitedze Health Centre

A range of other project impacts were reported especially for the more vulnerable. People reported the usual benefits of convenience, prestige, and dignity. The reduced likelihood of stepping in shit was another commonly reported benefit. People also said that they can now eat pumpkin leaves since people aren't defecating in the fields. A number of households reported they intend to bring their gardens closer to home without fear that the crops will be contaminated by open defecation, which has the potential to improve nutrition.

Much of the support provided for the most disadvantaged comes directly from Water Works rather than the community's own efforts to reach ODF. Other WASH implementation organisations are also providing subsidies for adaptations to make latrines inclusive, in line with national guidelines. There were instances where Water Works could facilitate the community to ensure that the disadvantaged are further supported e.g. supporting a neighbor by digging a pit or building a bathhouse. The Mzuzu Smart Centre has undertaken research on how to improve the effectiveness of CLTS processes through inclusion of people with disabilities and the elderly in CLTS processes, which could be instructive for Water Works. WaterAid have also been training masons on accessibility designs and making links with Disabled People's Organisations like FEDOMA would also help build capacity in this area.

The communities visited lacked toilets for churches and passers-by, referred to as Level 2 ODF in the national policy. It is difficult to see how a community can remain ODF without these toilets.

Relevance

The project targeted communities in priority areas based on their WASH needs. The project was consistent with global goals that aim to provide safe WASH to rural communities. The project has contributed to national WASH results, which is directly linked to reducing child mortality and the

burden on women and girls. Implementation through the district health structures added to the relevance of the project and served to strengthen district structures.

The choice of water lifting technology is well suited to improving access for vulnerable and 'hard to reach' communities, where service providers find it difficult to reach (in terms of their geographical location) as well as populations that have been left out of WASH development activities. However, the Water Works model does not fully engage with the specificities of the national context. Government of Malawi has a zero-subsidy policy for sanitation. Promoting subsidies in the Water Work project areas can undermine people's self-efficacy, commitment to ODF, create dependence and reduce the likelihood of sustainability. However, the Water Works subsidy-based approach has some inefficiencies – at present the subsidy is provided to all, regardless of need, thus some households have 2 toilets and will continue to use the unimproved latrine (in the dry season) until it is full. The alternatives, such as the use of sanitation loans through sanitation marketing approaches, can be a slow and expensive process, that fails to reach the poor. Whilst, Water Works should avoid supporting communities with resources to construct toilets in line with sector policy and the programmes of other NGOs, it appeared that the communities visited were using latrines and all vulnerable people had a toilet. Globally, more research and documentation on the use of a wide range of subsidies and incentives as part of the community-based approach would be valuable.

Water Works staff attend the WASH Cluster meetings (monthly) and coordinates with the Water and Environmental Sanitation Network (WES Net) as well as liaise with NGOs such as Pump Aid (regarding their self-supply approach and collaboration on the well repair business) and Fishermen's Rest (to trial their Madzi Alipo monitoring software). However, such limited sector coordination and networking – as well as failure to capture innovation and learning to inform the sector – limits the complementarity and credibility of Water Works with partners and other major players in Malawi and means there are potentially missed opportunities to add value to the WASH sector.

Sustainability

Water Works has collected evidence on extent to which interventions been sustained over time/ how this compares to others through the Sustainability Survey. A Water Point Functionality Survey was used to assess the functionality of the 64 water points installed from 2010-2016. Only 34 of the 64 water points were functioning, 19 of which were installed in 2016 and 9 were installed in 2015. One of the pumps installed in 2010 was working. Water Works is taking a number of steps to address this through the technology selected and management models. Water Works has also taken a sustainability focus in activities including the performance of various management models for water supply and sanitation and hygiene as well as taking a sustainability lens in M&E systems. The choice of Rope and Washer pumps supports sustainability: the most common repair is to the rope when it slips, most instances were repaired the same day.

External follow-up and continued training are a critical component in sustainability. Water Works set up a repair service to ensure that all water points, latrines and handwashing previously constructed are maintained. The intention is that this repair service can be self-financing once Water Works is no longer operating in the area. The true service costs of rural water have never been calculated. This oversight needs to be addressed, as tariffs based on customers' willingness to pay may be too low under the current model.

Water Works have also collaborated with the area mechanics system and commercialisation of spare parts. Greater reliance on the private sector model may prove more sustainable. Mzuzu Centre of excellence in Water and Sanitation (SMART Centre) is running workshops to train the team in business skills on running a profit-making business and to manage and service and the technological

developments to enhance skills in latrine construction and pump technology. Examples from MSABI (Tanzania) and Oxford University (Kenya) may be helpful in developing this model further (see boxes).

Pump for Life - Subscription based delivery of water point maintenance services

MSABI has developed a subscription based system for water point maintenance, branded Pump for Life. The system consists of private sector driven proactive (monthly) and reactive maintenance and repair services in exchange for a monthly (or annual) subscription premium. The premium can be paid through mobile phone money transfer services, making it accessible to people in remote areas with no access to conventional banking. Maintenance is performed by a decentralized network of mechanics, who are situated in strategic hub locations to maximize operational efficiency. An advanced Information and Communication Technology (ICT) water point surveillance-response system is used to monitor distribution and functionality of water points, subscription premium payments, and track spare part usage and water point history. The payment systems with regular premiums ensures financial resources are available at any point in time.
http://msabi.org/

Some of the water points Water Works dry up (low rainfall and water table goes down and so are rehabilitated: wells might need to be dug deeper and lined). Rope pumps cannot normally serve more than some twenty families. The ratio of Water Works pumps per number of people does not always follow the standards for Malawi (250 persons/water point). This could compromise sustainability. Although no significant relationship between the frequency of breakdowns and population served was recorded. Further consideration will be needed for the future resilience of water resources: changing rainfall patterns, more frequent and severe floods and droughts and continued deforestation, population density will affect groundwater resources in Malawi and have implications for the yield of shallow wells. Approaches like 'drinking water safety and security planning' could be considered to improve resilience of water supplies[6]. Tearfund has implemented Water Safety Plans[7] in planning in Malawi. In other contexts the approach has been combined with water security training (Drinking Water Safety and Security Planning). This approach has proved effective at re-invigorating community water supply committees, building more resilient water supplies in response to climate change and disaster as well as ensure safer, more resilient water supply systems.

Oxford University's FundiFix model

In the Fundifix model local companies in Kenya, working in partnership with government, investors, communities and UNICEF, guarantee a high quality team to fix repairs fast. Communities subscribe to a service contract which protects their rights but makes them responsible for regular payments. This model has four connected dimensions:
• Professional Services – user payments and investor finance are contingent on service delivery. The FundiFix model guarantees a rapid service with offices staffed by local entrepreneurs and qualified technicians, with contracts contingent on high quality service delivery;
• Sustainable Finance – stable and adequate flows of finance from government, users and investors are required to maintain water infrastructure across a diverse portfolio of waterpoints serving everyone, every day;
• Smart Monitoring – regular data flows from mobile technologies with data analytics support a rapid repair service and inform sector monitoring, regulation and resource management;
• Institutional Coordination – government leadership in separation of policy, regulation and delivery is critical to ensure sector partners have clear roles and responsibilities.

[6] https://www.slideshare.net/RogerSingleton2/uniceffnpacificdwsplowresdraft
[7] https://wedc-knowledge.lboro.ac.uk/resources/e/mn/053-Water-safety-plans.pdf

Sustainability of sanitation is promoted through the quality of the facilities installed. The Water Works model means that households start at a higher point on the sanitation ladder and the latrines are less likely to collapse in the rains. Investment in a more expensive facility appears more sustainable and likely more cost-effective in the long run. Previous assessments[8] have suggested that low-cost facilities may be more expensive to maintain, due to shorter lifespans and more regular maintenance requirements. Environmental sustainability has also been promoted through improved sanitation – households no longer need to cut down as many trees from the forests to construct latrines.

The partnership agreement with the MoH enables the HSAs to continue to support the project communities to prevent relapse to open defecation and monitor hygiene behaviours. In two communities where an HSA had been transferred to a different catchment area and no other HSA had been assigned, slippage was apparent: sustainability of handwashing stations dipped – plastic bottles were found cracked or missing - and latrine hole covers were missing or weren't being used, roofs were missing.

A toilet in Mvemve

[8] Trémolet et al (2010) *Financing on-site sanitation for the poor: a six country comparative review and analysis* Washington DC: The World Bank, Water and Sanitation Program, Technical paper.

Efficiency + Value for Money

Water Works has demonstrated efficiency in terms of the costs-results relationship as well as through the integration of cost-efficient approaches and measures. Project management has been particularly strong. Implementation was sufficient to reach most targets within the budget. The staff have a truck to reach the villages as well as motorbikes (although these are second hand and break down frequently), which has also improved project efficiency. Coordination/ feedback mechanisms between Lilongwe and community implementers is strong. Value for Money is evident: activities were, in the main, delivered at the required quality delivered for the lowest possible cost. People in targeted communities report (a range of) benefits and the project has reached the poorest people. The people/communities targeted appear to have changed a number of WASH-related practices and behaviours. Additional evidence on the cost- effectiveness of the approaches would be useful to collect in the longer term.

Effectiveness

The project is viewed to be effective: it is on track to achieve most of the planned activities and even surpassed some of its output and outcome level targets in the log frame. Thus, it has made a contribution to Malawi's achievement against the MDGs targets. Reach[9] of the project was significant as attendance and participation rate in the project was high. Households now have WASH infrastructure and knowledge of better quality and in some cases closer to their homes.

Water Works has been experimenting with pumps as part of research and development including the solar pump (in Mwase), Rope and Washer pump and Alinafe pump. Efforts to train the Areas Pump Mechanics and HSAs means it has the potential to leave stronger districts behind. Overall the quality of the project implementation has been high. The project has demonstrated a number of innovations such as an innovative financial tracking system, cost-effective and sustainable technologies as well as an effective monitoring system.

Sanitation and hygiene messaging, through one-way communication, is not to be sufficient to achieve long-term effect on handwashing and sanitation (latrine use, safe faeces disposal, open defecation). The PHAST training has had positive results on the knowledge of key handwashing times although the practice of handwashing with soap was reported to variable. The CLTS process relies on community-based leadership and community action plans, as well as community support to help households implement changes in sanitation and hygiene practices. For community-based approaches, a natural leader (e.g. community leader) who is part of the community and is representative of the community is very important to facilitating implementation. This is currently missing in the approach. The gender of the implementer seems to be important, for example, women would rather trust a woman when they wanted to discuss female hygiene.

Although the way the project has been implemented appeared to show fidelity[10] to the plan. The dose[11] of the project appears to be low. A regular and extended structure to follow up may be more effective and sustainable. For follow-up HSAs say they make visits to household every 1 or 2 months (but varied on household need); visits of 10 to 30 minutes, depending on goal of visit; provision of support for hygienic behaviours such as food hygiene, childcare, latrine maintenance and grey water disposal as well as the signs and symptoms of diarrheal disease and parasitism, mechanism for fluid replacement through oral rehydration salts. Multiple mechanisms may be needed for sustaining behaviour change.

[9] *degree to which the intended audience participates in an intervention by 'their presence'*
[10] *the degree to which interventions are implemented as intended by its developers*
[11] *This concept refers to the proportion or amount of an intervention (or the combined strategies) delivered to participants; often measured through frequency (e.g., twice per week), duration (e.g., duration of programme in months) and intensity (e.g., total a programme delivery hours).*

Water Works could review the potential of a health club-type model. The impact of Water Works could be further improved through consolidation to achieve 'healthy homes' that provides training over 6 months and results in a 'healthy home' certification and 'healthy communities' that involve community-wide campaigns, to clean-up, deliver messages at community events such as religious services and community meetings.

Barriers to behaviour change include the habits of villagers, short period of planning and project implementation, frequency of follow-up by HSAs, the relevance of the hygiene training (messages not necessarily tailored to have relevance for the specific village). The HSAs appeared to promote a step-wide approach, little by little, periodic visits from outsiders to ensure people keep up good practices. The key barriers and facilitators need to be well understood when planning an intervention and selecting the right combination of sanitation and hygiene approaches. More in-depth formative research during the assessment phase, leading to the right selection of promotional elements, seems to be a critical step for programmes aiming at behaviour change for sanitation and handwashing.

The certification process seems to be a useful incentive for project communities in achieving ODF, and could potentially be used to move people up the sanitation ladder or achieve total sanitation. For instance, Seeds of Hope International Partnership has developed Healthy Home Initiative[12], run as a 3-day course by the Community Health Promoter. Families receive a Healthy Home Certificate once they have adopted all the elements of a healthy home – clean water, proper sanitation and hygiene, nutrition, agriculture, and vocational skills development.

Community Health Clubs

Community Health Clubs operate over a period of six months where club members gather weekly at a meeting point to discuss and debate a particular health topic. The 20+ session curriculum targets the entire range of WASH issues and behaviours, including personal hygiene, hand hygiene, drinking water and defecation practices, kitchen hygiene and environmental management for vector control. The session is led by a trained facilitator, sometimes from the community, who incorporates the use of pictorial cards displaying images of good and bad health practices into the discussion from the CHC toolkit. The set of cards are an expanded set of traditional PHAST drawings and a range of participatory activities designed to generate debate. Once consensus is achieved, the new practice is assigned as homework to be completed by the next meeting. The 6 months culminates in a 'model home competition'. Group identity formation enables members to apply positive peer pressure and provide social support to motivate behaviour change. Group identity is created and reinforced by an aspirational club name, slogan and song. Membership cards are used as a concrete representation of affiliation to the larger peer group and for self-monitoring.

Recent interventions to increase rates of handwashing with soap (like Super Amma[13]) have relied on messaging that was intended to increase the emotional/psychological rewards of handwashing with soap such as good parenting and aspirations for success as well as the costs of not washing hands with soap (community rejection) and the disgusting nature of routine hand contamination. Components have included community events, certificates, report cards, visual reminder stickers on front doors and bathroom walls, public pledging ceremonies, rallies, putting up posters around the village and household visits.

Summary findings

[12] http://sohip.org/solutions/wet-c/hygiene/
[13] http://www.superamma.org/

The findings are rated according to Inadequate, Satisfactory, Good and Outstanding.

Area	Performance indicator	Notes
Impact	Good/ Outstanding	The project achieved a good impact on water availability and water quality. The time to collect water has been reduced. And most households in the communities were within 15 minutes of the new pump. The waiting time at the water point was also reduced, but this was partly undone by the effects of population increase in some communities. The project had improved sanitation facilities at home. However, the positive impact is compromised by the lack of functioning hand washing facilities. Extended contact time with communities might improve impact on sanitation and hygiene.
Relevance	Good	The coverage of water and sanitation facilities in the target areas was relatively low. The project met as-yet unserved or partially served community needs for access to improved water supplies, it provided sanitation infrastructure and supported improved hygiene practices at the community level. However, the project is not entirely consistent with the national policy or the MoIWD guidelines for the WASH sector as described in the ODF Roadmap.
Sustainability	Satisfactory/ Good	The project has demonstrated an innovative approach to ensure sustainability of water points. These approaches used have shown good performance to date, with the potential for long-term sustainability. More attention is required to the sustainability of the latrines – elsewhere a prolonged period before communities are declared ODF has proved effective in sustaining ODF (or the risk of potentially withdrawing ODF status?). Water Works approach goes beyond technical aspects to institutional strengthening suggesting the potential for lasting value
Efficiency	Good	The project reached most of its targets within the timeframe and budget. Water Works has very good data management and M&E systems in place. The project achieved the targets as well as strengthening the capacity of the local health systems.
Effectiveness	Good	This was an effective and flexible project that reached or even surpassed its targets. It aims to strengthen districts and community structures. In the main the toilets distributed to families are being used and maintained properly

Conclusions and recommendations

The findings show that Water Works has had a meaningful and sustained impact at household level. However, the evaluators' view is that certain aspects of Water Works approach are limiting the organization's opportunities for significant impact. These include (a) Water Works deliberate decision to provide a fully integrated approach to WASH irrespective of need, (b) inefficiencies in the current sanitation model (c) the effectiveness of hygiene promotion. The evaluation is an opportunity to re-think how it can better respond to the challenges people continues to face.

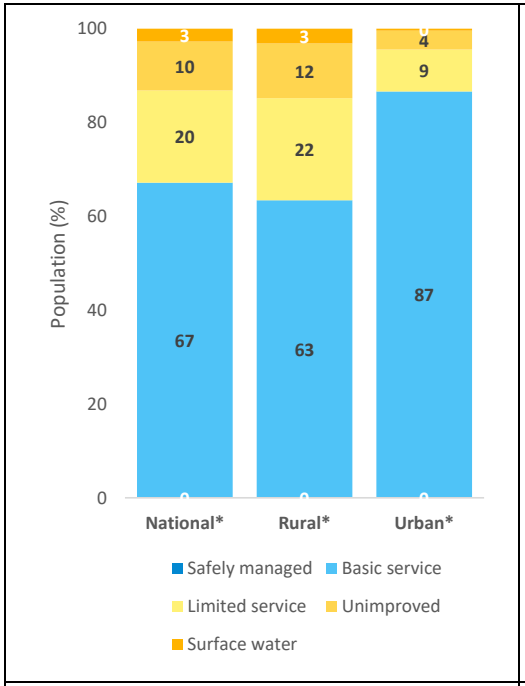
Findings	Impact/risk	Main recommendation	Sub-recommendations
Review the sanitation approach	The reliance on subsidy in the current approach makes the model costly and non-scaleable. Subsidy undermines the government policy and principles of CLTS. New latrines have been installed next to an unimproved latrine that households are still using – this all has a reputational risk	WW should avoid subsidising latrines in line with Malawi policy, although villagers were using latrines and all vulnerable people had a toilet. Consider promoting community own investments and support to the most disadvantaged. Consider whether some form of financial subsidy may be necessary to ensure that the most vulnerable community members can use a toilet that lasts. Assemble national WASH policy documents, to map out the roles and responsibilities of the various public sector and non-government actors in the WASH sector. Evaluate costs (per beneficiary) and re-assess cost-effectiveness Delay celebrations to ensure that behaviour changes or lengthen the time between completion of latrine and ODF verification Consider revoking ODF status where there is slippage Review the effectiveness of current demand creation (educational messaging) Innovate further in latrine design - there could be further options for latrine design.	Promote consultation and involvement of community in decisions on latrine technology options and slab type. Latrine covers need to fit the drop-hole better. There were various innovations for the latrine entrance. Ensure that all designs provide privacy to the user – as this appeared to be an important concern such as a simple door design would be helpful (or tying systems for sacking flaps). Support the sharing of learning between villages. More research and documentation on the use of subsidies and incentives would be valuable to inform the national debate.
Review the effectiveness of the hygiene awareness training	The current approach risks a lack of effective demand for sanitation. The risk is that behaviour doesn't change or changes are not sustained PHAST training focuses on handwashing rather than hygiene more generally	Engage more fully with hygiene behaviour change component of the WW model Consider formative research to inform the hygiene promotion approach Review the behaviour change approaches based on latest sector thinking r.e. nudges and social norms. Also consider the potential of the Community Health Club or Healthy Homes approach Expand the number of HSAs who are Master trainers (through training of trainers) to promote health system strengthening and reduce dependence on Water Works Provide quality assurance for HAS training of the community	Evaluate the hygiene training delivered by the HSAs and provide some testing and review to help revise and make improvement. Water logging around the bathhouses was fairly common and, although not part of the WW project, could be addressed through a future focus on healthy homes. Hygiene promotion around urination could prevent urinary schistosomiasis. Hygiene messaging targeting ringworm and handwashing messaging for respiratory infections could be improved since both appeared common in children.

Findings	Impact/risk	Main recommendation	Sub-recommendations
		Expand learning visits between WWs villages as well as competition between households on toilets and handwashing Include MHM in PHAST/hygiene promotion Review the potential of a 'health club' type model; i.e consolidation of hygiene programme to achieve healthy homes over a 6 month period andmove households up the sanitation ladder	
Focus on safe water chain and point-of-use	Risk that households have the impression that they have safe drinking water when in fact it is only 'clear' water.	Ensure pit latrines are not close to water points (suggested minimum is 70 m) and animals are kept away. Inspect wells for cracks in the sides of the apron, poor drainage and maintenance, and for pathways in the top of the slab – include this monitoring in the guarantee period Eventually replace shallow protected wells in the WW villages Consider closing open hand dug wells Consider the potential of Water Safety Planning/Water Safety and Security protocols and practices appropriate to the rural Malawian context Ensure that HSAs are consistently promoting household water treatment and safe water storage As Baseda (the NGO co-ordinating the network of pump technicians) are leaving the area, establish direct links with area pump technicians.	Protective equipment, in addition to hard hats, is necessary for well diggers. Need for more consistent quality of soakaway pits, which vary in their effectiveness in preventing pooling of water. Water Works could consider building laundry stands on a demand led basis, as some communities do not use them properly. Water Works repair service could expand into selling rope pumps to communities, depending on communities' ability to pay. The repair service should base its charges on the true service costs rather than what customers would be willing to pay. Review other models based on a subscription system for maintaining water points are recommended such as MSABI (http://msabi.org/) and Oxford University's Fundifix model.
Potential to expand collaboration with others in the sector	Limited sector coordination and networking means there are potentially missed opportunities to add value to the WASH sector. Failure to capture innovation and learning to inform the sector Relationship with the sector has the potential to become competitive rather than collaborative	Consider all field programming as either demonstrating high quality service delivery or piloting new and innovative approaches that others can take to scale Ensure that learning objectives are well articulated at the outset of future projects Reach out to others for potential collaboration in national coordination and networking, including joint fund-raising, based on mutual interest and complementary strength	Additional evidence on the cost-effectiveness of Water Works approaches would be useful to collect in the longer term.

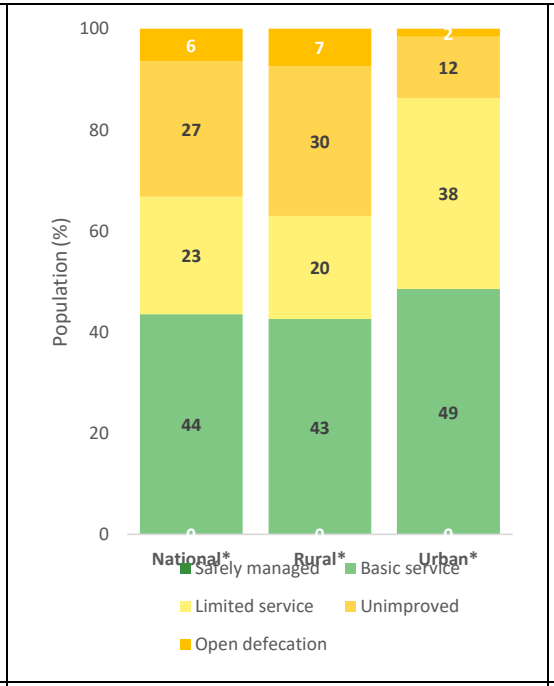
Findings	Impact/risk	Main recommendation	Sub-recommendations
	Missed opportunities to influence major DPs with much larger budgets Alone, Water Works has only a small impact on national coverage		
Vulnerable people receive services but some are still slipping through the net	There was a one size fits all approach to pedestal design for those with mobility problems. Not all household members (eg. children) could use a raised seat installed for another member of the family. Other family members are being excluded from use of dedicated latrines for people with disability People with a disability are not consistently involved in the process of latrine design and construction	Consider training for HSAs and Water Works staff on equality and non-discrimination (e..g with CCAP SMART Centre/WaterAid and WEDC materials) Ensure the HSAs facilitate the engagement of people who might be disadvantaged in the Water Works project and support where needed. Target young women and adolescents (out of school) in the project activities Provide builders with information on simple adaptations (handrail and moveable seating provision) for toilet design Ensure vulnerable people are consulted and involved in design of facilities and provide options that people can select from Meet with local Disabled Persons Organisations	Alternative arrangements are needed for those who have challenges getting to the toilet, especially at night (eg. commode chair or screen). Water Aid have trained masons on accessibility designs and links could be made with Disabled People's Organisations such as FEDOMA.
Consolidation rather than expansion	Reputational risk of promoting unsustainable approaches Expanding to new villages/districts risks spreading resources too thin Exit strategy – dependency of communities on Water Works	Provide continuity with current communities rather than diversify into too many other locations. Continue the strategy for sustained services in the project villages. Select new project villages based on clustering and closeness to existing sites, to promote an Area Wide Approach to increases in WASH coverage Focus on supporting households towards a 'healthy home' and ODF ++ with a focus on food hygiene, solid waste disposal and surface drainage. Increase the competencies of Water Works staff and HSAs to deliver this Establish the repair and maintenance services for hand pumps. Establish life-cycle costs for pumps before installation, to guide tariff setting. Collaborate with area mechanics.	

Findings	Impact/risk	Main recommendation	Sub-recommendations
		Facilitate the replication of the innovation seen in villages across the Water Works project area	
KAP survey	Increased latrine coverage, with safe water and improved hygiene practices is believed to be effective for preventing diarrhoea; but this outcome is difficult to prove in a reliable way through self-reported or carer-reported diarrhoea data	Ensure accurate estimates of the number of households in villages to inform log frame targets Change the KAP survey in favour of a shorter recall period (3 days) to more accurately capture diarrhoea severity and duration. Add a definition of diarrhoea to the KAP survey. The question on WASH-related mortality will provide unreliable data and should be deleted.	Given recent research findings, reconsider whether diarrhoea is primary to the project's theory of change.

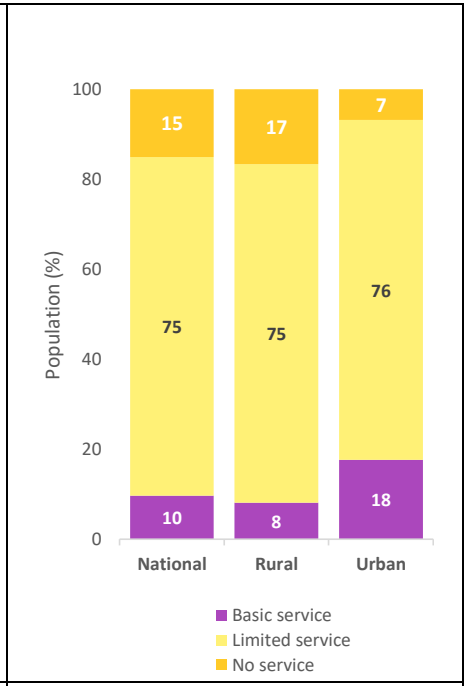
Annex A: Estimates on the use of water, sanitation and hygiene in Malawi



Drinking water



Sanitation



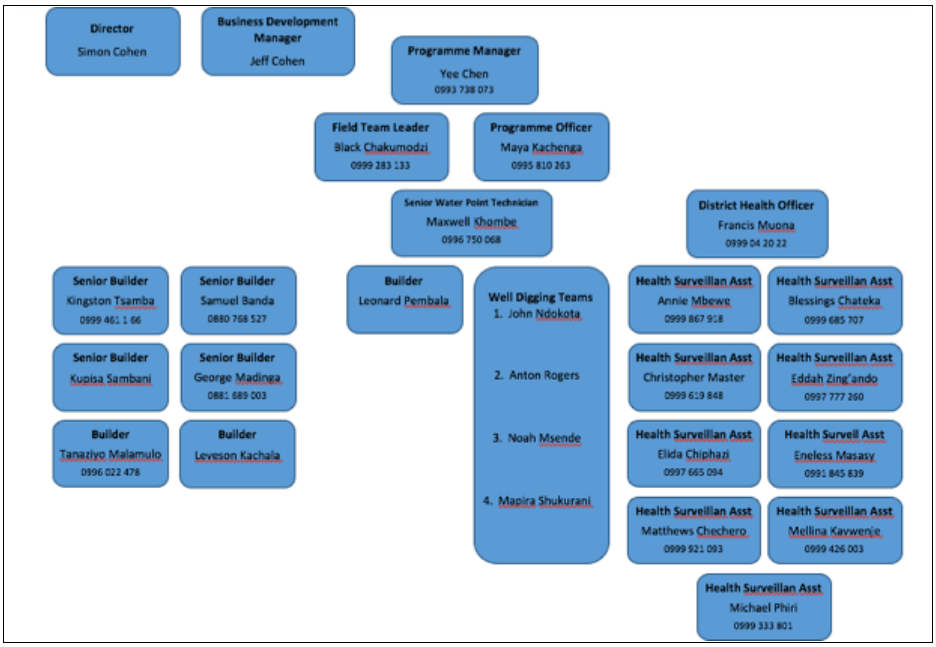
Hygiene

Source: Joint Monitoring Programme Update 2017 reporting 2015 data, https://washdata.org/,

Annex B Schedule of Visit (and persons met)

Date (2017)	Activity
Sunday 26th November	Consultant arrives in Malawi
Monday 27th November	Meeting with Water Works Team Yee, Maya, Black and Maxwell
Tuesday 28th November	Meeting with Baseda and Area Pump Mechanics [Lebson – Project coordinator in Lilongwe as well as Peter Muare; Redson Mtoso] Visit to Henock (limited groundwater) and Chidelu (rehabilitation of an existing Afridev)
Wednesday 29th November	Visits to: Kwayera; Galundani (pump locked till the community built a fence and soakaway); Chikhawo (small cohesive village, rope broke); Mwakhundi (ground is soft, apron and slab collapsed; concrete rings added) Meeting with Wilson – well digger
Thursday 30th November	Mveme 2 (Inclusive latrine built for a particular household); Malioti; Fillimon
Friday 1st December	Visit to Kauma; Mambalawakuda; Mveve 1
Saturday 2nd December	Report writing
Sunday 3rd December	Report writing
Monday 4th December	FGD with HSAs [Foreign, Eneless, Judy, Matthews and McDonald] View Health Centre records
Tuesday 5th December	Meeting with Francis Muona, EHO for Lilongwe District Meeting with Paulos Workneh –UNICEF WASH Chief Report writing
Wednesday 6th December	Depart

Annex C Water Works Organogram



Annex D Key Informant Interviews Aide Memoire

Global level

Stakeholder Group	Who this might include	Main focus of discussions
Water Works staff/trustee	• Simon Cohen - Director • Jeff Cohen - Business Development Manager • Patrick McMahon	• Evaluation questions • Their knowledge on Water Work project and overall programme – progress, successes, gaps, challenges • Their recommendations to strengthened the programme in the future?
External agencies (Smart Centre, Inter Aide and Pump Aid)	• External agencies with similar experience in Malawi	• Their experience/perception of Water Works – progress, successes, gaps, challenges • The niche for Water Works • Their recommendations on how Water Works can strengthen its programme in the future?

National level - Proposal for people to meet during the process

Stakeholder group	Who this might include	Main focus of discussions
Water Works Staff – based on the organizational organogram	• Programme manager • Field Team Leader • Programme Officer • Senior Water Point technician	• Have you met commitments from the grant agreement? • Own assessment of the effectiveness of the project - Evaluation questions • Systematic monitoring of water point functions? ODF? • Systems to ensure sustainability of water points? Toilets? HWWS? • Institutionalization of training? • Financial arrangements to ensure O+M costs are covered? • Monitoring water committee's capacity and financial status? • What is the method to report repairs? • Procedures for routine maintenance / minor & major repairs? How effective and efficiency are they? • Monitoring of water quality? • Are spare parts available? • Is there a plan in case the well needs to be replaced? • Links between planned interventions and local government development plans? • Views on Water Works' niche in the sector? • Views on Water Works' strengths and weaknesses? • Specific examples / case studies of Most Significant Change
Water Works Teams	• Builders • Well digging team • Health Surveillance Assistants	• Focus Group Discussions – separate with the builders, well diggers and HSAs • Specific examples / case studies of Most Significant Change

Collaborating partners	• Staff at field level • Representatives of management	• Their observations and experiences – progress, successes, gaps, challenges • Specific examples / case studies of Most Significant Change • Their recommendations to strengthen programme in the future?
Sector stakeholders in country	• Government representatives- District Health Officer and others • Private sector suppliers	• Their observations on how well Water Works has been implementing – progress, successes, gaps, challenges • Their recommendations for how this could be strengthened in the future?

Annex E Chitedze Project villages (2015-2017)

Chawala Katambo	2015
Chayela	2015
Galundani[14]	2015
Kammayani	2015
Kasambwe	2015
Kauma	2015
Mambala Wakuda	2015
Mdima	2015
Msenda	2015
Mwase	2015
Mtentha	2016
Amidu	2016
Chembe	2016
Chimba	2016
Chinguluma 1	2016
Kacheta	2016
Kafansiyanji	2016
Kaondo	2016
Kayala	2016
Malezi	2016
Malioti	2016
Mpingu Chisete	2016
Mpingu Sella	2016
Mvemve 1	2016
Mwakhundi	2016
Nathamanga	2016
Ngwanya	2016
Simulemba	2016
Sinthawina	2016
Solomon	2016
Chidatha	2017
Chidelu	2017
Chikhawo	2017
Chimlaza	2017
Chimzimu	2017
Fillimon	2017
Henock	2017
Kakhome	2017
Kambewa	2017
Kasinja	2017
Kwayela	2017
Mmezela	2017
Mlamba	2017
Mpanje	2017
Mphanda	2017
Mvemve 2	2017
Mziche	2017
Nathamanga Kamende	2017
Ndala	2017
Timpuza	2017

[14] Highlights indicate visits

Annex F Selection criteria for communities to visit

The following table lists the selection criteria that will be guide identifying the sample of communities to visit.

Criteria	Notes	Numbers to aim for
		12 communities minimum
Successful / unsuccessful	Mix of successful communities and those that have faced problems in becoming ODF and moving up the sanitation ladder	Min No successful = 10 Min no unsuccessful = 5
Time since project completion	The amount of time that has passed since project completion can provide insights into sustainability of water, sanitation, hand-washing and behaviours and the sustainability of impact.	• 2015: 5 • 2016: 5 • 2017: 5
Interesting / innovative good practice	Communities where innovative or interesting efforts have been made. And examples of where these show potential for scale (wider adoption)	At least 2 communities
Varying social backgrounds	Communities with people from particular disadvantaged groups – both whole communities or communities with some members who come from marginalised groups – such as ethnic, religious or political minorities	To visit communities from different social contexts
Extreme poverty	Communities or sections of communities that are known to have particular vulnerabilities, such as: extreme poor or high numbers of elderly, child or female headed households	Min = 7 considered extremely poor communities
Particularly challenging contexts	From different contexts / places which face different challenges: • Some that have difficult technical conditions, such as flooding risks or sandy soils (where the poorest may struggle more to construct a robust/durable latrine) • Communities who have faced crisis	If possible at least 5 different types of particularly challenging contexts

Annex G Stakeholders met at the community level

Stakeholder group	Who this might include	Main focus of discussions
Householders	Householders including: Individual: 1. Gender 2. Age 3. Health / social barriers (disability) Group related: 4. Difference / other form of discrimination (such as due to religion, ethnicity, culture) Economic: 5. Income level - extreme poverty Geographic: 6. Living in vulnerable contexts or on the edge of the community	• How they feel about the process and the extent to which they have been involved throughout? • What the outcomes have been? • How were they able to build a latrine and hand-washing facility / was any support provided / if so what? • Where the gaps and opportunities are? • How would they recommend that the process be improved in the future?
Community groups	• Religious Groups • Local disability organizations • Local women's organizations • Youth groups • Groups for older people • School teachers/head • Carers • Religious leaders	• Which groups of people do they feel may have struggled the most to build or sustain a latrine under the CLTS process and why? • How well do they think people from disadvantaged groups were supported in the CLTS process – with good / bad examples? • Their recommendations for how the process could be improved in the future?
Sub-national stakeholders involved in facilitating the process	• Water Committees • Pump Mechanics • HSA • CLTS facilitators • Leaders and Natural Leaders • Traditional authorities • Local government authorities • Local community development staff • Local NGOs / implementing organizations • WASH or Health Committees	• What tools / processes they use? • What training and support they have had? • What has worked and what stops things working? • Their recommendations for how the process could be improved in the future?

Annex H Focus of learning from the community visits

Focus	Notes
The project	• Try to understand the project – what was done, what changed? • Can you remember what happened during the project in this village? • Were you/your family able to take action – on water points, latrine, hygiene behavior change? • Is water, sanitation and hygiene easy to access now? Were there things that you didn't like about the process? Were your views listened to?
Disaggregation by income, gender, age and ability	Identify specific examples: • Are there any people who have had problems collecting water, building a latrine / hand washing facility? • Are some groups left out of decision making? • Did they get an extra help?
Positive Change	• What positive impacts have community members experienced? Why have these happened? • What are the two biggest positive things that have come out of the project?
Negative Change	• Any inadvertently negative impacts - how they came about and what could counter it. • What are the two biggest problems that have happened because of the project?
Recommendations	• Recommendations from people from disadvantaged groups as to how to assist disadvantaged groups • If you were helping other communities to improve their WASH, what would you do differently from what was done in your village? How would you improve what was done?

Annex I Evaluation Tools

OECD-DAC criteria	Evaluation Questions	Evaluation tool
Relevance	• To what extent did Water Works support achievement towards the MDGs? o MDG 7 (halving the population without sustainable access to safe drinking water and basic sanitation); o MDG 4 (reducing child mortality, specifically relating to the number of children under 5 experiencing diarrhoea in previous 2 weeks); and o MDG 3 (promoting gender equality and empower women).	Interviews to inform an overall assessment of the contribution of Water Works
	• To what extent did the project target and reach the poor and marginalised? o How were the beneficiaries selected and were the beneficiaries informed of the selection criteria? o How effective were the selection criteria in reaching out to the most vulnerable populations?	Interviews, project documentation, field visits
	• To what extent did the project mainstream gender equality in the design and delivery of activities?	Project documentation, interviews, field visits
	• How well did the project respond to the needs of targeted beneficiaries, including how those needs evolved over time? o What was the level and quality of participation of the beneficiaries in the project? o How and to what extent were the monitoring, evaluation findings used to inform decision-making and the improvement of project implementation?	Project documentation, interviews, field visits
Effectiveness	• How well were the activities, outputs and outcomes documented and monitored?	Project documentation Interviews
	• To what extent are the results that are reported a fair and accurate record of achievement?	Project documentation Interviews
	• To what extent has the project delivered results that are value for money? To include, but not limited to: o How well the project applied value for money principles of effectiveness, economy, efficiency in relation to delivery of its outcome; o What has happened because of DFID funding that wouldn't have otherwise happened.	Project documentation Interviews Assessment using VFM-WASH checklists Produce a counter-factual based on country data
	• To what extent has the project used learning to improve delivery?	Interviews
	• What are the key drivers and barriers affecting the delivery of results for the project? o What were the main challenges of the project and how well were they addressed	Documentation Interviews

	○ Generally, were the activities carried out in line with the original plans? If not, were the changes adequately discussed, documented, and justified	
	• How effective were the partnerships developed by Water Works with other government agencies and NGOs?	Interviews
Efficiency	• To what extent did the charity deliver results on time and on budget against agreed plans	Project documentation
	• To what extent did the project understand cost drivers and manage these in relation to performance requirements? ○ Was a suitable financial control system in place? ○ How cost effective was the intervention? What cost-effective alternatives could have been used? ○ What systems were in place to ensure inputs provided were of the highest possible quality and were acceptable to beneficiaries? ○ Is the staffing (quantity and quality) and the structure appropriate to the programme being implemented?	Project documentation Interviews
Sustainability	• To what extent has the project leveraged additional resources (financial and in-kind) from other sources? What effect has this had on the scale, delivery or sustainability of activities?	Project documentation, interviews, field visits
	• To what extent is there evidence that the benefits delivered by the project will be sustained after the project ends? ○ What adaptations, if any, should be made to improve programme sustainability?	Project documentation, interviews, field visits
Impact	• To what extent and how has the project built the capacity of civil society?	Project documentation, interviews, field visits
	• To what degree did the intervention address the WASH needs of the targeted women, men, boys and girls and contribute to reduced vulnerability?	Project documentation, interviews, field visits
	• What unintended consequences (if any), whether positive or negative, has the intervention had on women, men, boys and girls?	Project documentation, interviews, field visits

Annex J Observation checklist

SANITATION STRUCTURED CHECKLIST				
Date of survey:	Community Name:		Toilet Photo ID:	
How old is the latrine	How many people in the HH use this toilet:			
SANITATION AND HYGIENE ASSESSEMENT				
Does the household have a latrine? ❑ Yes ❑ No	**Does the toilet facility have a concrete slab?** ❑ Yes ❑ No	**Is the facility shared with other HH?** ❑ Yes ❑ No	**Does the latrine smell?** ❑ Yes ❑ No	**Are faeces visible on the floor or pan?** ❑ Yes ❑ No
Are there flies or insects? ❑ Yes ❑ No	**Is the pit leaking?** ❑ Yes ❑ No	**Does toilet facility have anal cleansing material / water available?** ❑ Yes ❑ No	**Does the superstructure give the user privacy?** ❑ Yes ❑ No	**Can you lock the facility from the inside?** ❑ Yes ❑ No
Do HHs pay for the pit to be emptied ❑ Yes ❑ No	**Is there a designated place to wash hands near the sanitation facility ?** ❑ Yes ❑ No	**Is a hand cleansing agent such as soap or ash present?** ❑ Yes ❑ No	**Is there soap?** ❑ Yes ❑ No	**What kind of soap do people use?** ❑ Laundry soap ❑ Any local soap ❑ Any cheap soap ❑ Other ❑ None
Do HH have soakaways for waste-water ❑ Yes ❑ No	**Is the facility adapted for people with special needs?** ❑ Yes ❑ No	**Where else do people go to defecate?**	**Does the household have a rubbish pit/means for disposal of solid waste?** ❑ Yes ❑ No	**What do you use for fertilizer on the vegetable plot?** ❑ Commercial chemicals ❑ Animal dung ❑ Compost ❑ Human waste
Are bathing facilities present and functioning? ❑ Yes ❑ No	**Is a dish rack present?** ❑ Yes ❑ No	**Are faeces visible in the community?** ❑ Yes ❑ No	**When children are too young to use the latrine where do they defecate?** Ground Potty Nappy Other	**Do HH treat their drinking water?** ❑ Yes ❑ No **Do HH store water safely?** ❑ Yes ❑ No
❑ **Comments**				
Remarks and general comments / Comment on soil formation and challenges with latrine				

<table>
<tr><th colspan="4">PUMP STRUCTURED CHECKLIST</th></tr>
<tr><td>Community Name:</td><td>Pump Reference Number:</td><td colspan="2">Photo ID:</td></tr>
<tr><td>Number of HH using the pump:</td><td>Time to collect water + queueing time
❑< 15 mins ❑ < 30 minutes ❑ > 30 mins</td><td colspan="2">Who collects the water?
❑ Women ❑ Men ❑ Children</td></tr>
<tr><th colspan="4">ASSESSMENT: PUMP, WATER QUANTITY AND QUALITY</th></tr>
<tr><td rowspan="2">Technical Functionality
❑ Mechanically functional and being used
❑ Not functioning as originally designed
❑ Non-functional / Not used</td><td rowspan="2">Rope quality: ❑ ok ❑ worn out ❑ broken
Rope tension: ❑ ok ❑ loose ❑ tight
Rope connection: ❑ ok
Grip on wheel: ❑ ok ❑ slipping

PVC parts
❑ ok ❑ worn out ❑ broken
❑ clean ❑ dirty</td><td colspan="2">Pumping ❑ easy ❑ difficult ❑ resistance
Water discharge ❑ ok ❑ very little</td></tr>
<tr><td colspan="2">Resource reliability:
❑Throughout the year
❑Seasonal failure
❑ Not accessible for most of the year</td></tr>
<tr><td rowspan="2">Structure
Welding: ❑ OK ❑ broken
Painting: ❑ OK ❑flaking
Rust: ❑ yes ❑ little ❑ much ❑ no
Axle: ❑OK ❑ damaged
Handle: ❑ OK ❑ broken
Grip lock: ❑ OK ❑ wrong direction
Height of handle: ❑ OK ❑ too high ❑ too low
Wheel: ❑ OK ❑ damaged</td><td>Number of breakdowns? ❑
none ❑ 1 ❑ < 5 ❑ > 5
Typical down-time: ❑ days ❑weeks ❑ months</td><td colspan="2" rowspan="2">Water taste:: ❑ Good ❑ Salty ❑Metallic ❑Rotten ❑ Bad

Turbidity: ❑high ❑ low ❑ clear

When was last sample taken of water quality? (+ results).....</td></tr>
<tr><td>Area around the pump:
❑Clean apron, good protective fencing and soak away
❑Deteriorated apron, protective fencing and / or soak away
❑ Badly maintained apron, fencing and / or soak away</td></tr>
<tr><th colspan="4">MANAGEMENT ASSESSMENT</th></tr>
<tr><td>Water Point Committee status
❑Manages finance + maintenance
❑Manages only financial or maintenance
❑Does not manage either</td><td rowspan="2">Are there women on the water committee
❑ 50% or more are women
❑ Less that 50% are women
❑ No
Women have key leadership positions
❑Yes ❑ No</td><td>Water Payment:
❑In-kind contributions (crops/livestock)
❑Monthly household contribution
❑When the facility breaks down
❑ Community vegetable garden for income
❑ No collection system in place
❑ Fee likely to cover cost of repair
❑ Fee insufficient to cover the cost</td><td>Fee collection
❑ All HHs contribute the agreed amount at the agreed interval
❑ Not all households always contribute
❑ Special arrangement for disadvantaged</td></tr>
<tr><td>Do you know who the Area Mechanic for your area is and his contact?
❑Yes ❑ No</td><td rowspan="2">Access to external support for O&M:
❑ Assistance available
❑Some assistance available
❑There is a lack of support

Training
❑ Women
❑ Vulnerable group</td><td rowspan="2">Training for the pump minder/committee
❑ Immediately after pump construction
❑ Not done yet but training planned

Type of training
❑ Routine maintenance
❑ Minor repairs
❑Major repairs</td></tr>
<tr><td>Ability of WPC to carry out repairs
❑ Repairs have been carried out to a high standard
❑Repairs have been carried out, but not to a high standard
❑Repairs have not been carried out
❑ No repairs have been necessary</td><td>Access to spare parts:
❑ in store;
❑ for sale in village;
❑for sale nearby;
❑ not available
❑ available, but not affordable</td></tr>
</table>

Annex K Stories of change from persons met

Date	Village	Who was visited / met	Photo (permissions given to take and use the photo and tell the story)
30th Nov 2017	M'vemve	Joy says before having a toilet she used to go for open defecation. Because of visual impairments (connected with Albinism) she finds it difficult to see where she is going and sometimes she used to tread in her own shit. She finds her own toilet easy to use and it's great to have the handwashing outside. She found the hygiene training useful but she said the difficulty is putting the teaching into practice. Although the elders teach the girls about menstruation she thought it would also be useful to learn more about this in the sessions.	
30th Nov 2017	M'vemve	Ezeryaa Machelu lives with her husband. She didn't pay for her toilet. She knows that open defecation is not good for their health. She thinks this toilet is better than her last one, but she would have liked a raised seat. No one asked her if she needed one. Her children and grandchildren helped her to build the toilet. She has a torch so she can even go to the toilet at night.	 

Date	Village	Who was visited / met	Photo (permissions given to take and use the photo and tell the story)
30th Nov 2017	M'vemve	Mercy is married with a child and has just moved to the village. She had a toilet when she lived with her parents and her husband built this one here. In the hygiene training she learned how to bath a child, how to keep the child's food clean and why it's important to wash hands before and after going to the toilet. She picks up her child's faeces with a hoe and put them in the toilet. Because collecting water takes less time she can now have more time to look after the child and clean the house.	
30th Nov 2017	M'vemve	Loufayou Lusia says he is very thankful for his toilet – he is blind in one eye and walks with a stick. He lives by himself. The Water Works team built him this toilet (although they didn't ask him what kind of toilet he would like) and he can walk to it by himself with his stick and finds it easy to use. His old toilet was difficult to use because he cant squat any more but he says this new toilet is like sitting in a chair. His daughter in law helps him keep the toilet clean and she also collects water for him and does his washing. His son and daughter in law live nearby and have their own toilet.	 

Date	Village	Who was visited / met	Photo (permissions given to take and use the photo and tell the story)	
30th Nov 2017	M'vemve	Margaret has a raised seat because she has trouble bending her knees. She spoke to the Water Works team after the hygiene training to see what they could do to help her. She had never seen a raised toilet before. She likes the toilet and finds it easy to use. She lives with her grandchild who is 11 years old. She looks after the child for her daughter (who also lives the village). Her grandchild finds it difficult to use the raised seat and so goes back to the mother's house whenever she wants to use the toilet. Margaret and her grandchild keep the toilet clean. Margaret still goes to collect the water by herself though – she goes twice a day.		
30th November		Water Works asked Alinafe and her mum Susana Joseph what kind of toilet she wanted. They had never seen a raised toilet before. Alinafe can not walk. She can go to the toilet by herself but it's a struggle – she pulls herself along with her arms. Sometimes Alinafe cannot make it in time. Her mum cleans up afterwards. Her mum doesn't use the toilet built for them but she uses a neighbours one instead. They destroyed their old toilet when this one was built. Alinafe says she has enough water to drink, she can go to the toilet and bath house as often as she likes.		

Date	Village	Who was visited / met	Photo (permissions given to take and use the photo and tell the story)
30th Nov 2017	M'vemve	Esther has a raised toilet because of a problem with her leg. She paid 700 KW for the toilet. After the hygiene promotion training she spoke with Water Works staff and asked them for a toilet that would be easier to use. She destroyed the old toilet because the termites have eaten the wood and the slab had collapsed.	 
30th Nov 2017	M'vemve	Edna said that her and her husband use the toilet – her grandchildren can't use it because of the raised seat is too high for them to use.	

Date	Village	Who was visited / met	Photo (permissions given to take and use the photo and tell the story)	
30th Nov 2017	Malioti	The village Chief – Hagston Kaponda - asked for a raised toilet because he has problems with his knees so finds it difficult to use a squat toilet. He saw a raised toilet in town and asked if Water Works could make something like that. The Chief said his role is to look after the community. He is also a traditional healer – he said that since the project people get less diarrhoea.		

Date	Village	Who was visited / met	Photo (permissions given to take and use the photo and tell the story)
30th Nov 2017	Fillimon	Eddah is an HSA. She visits each of her communities once a month – and talks with them about health and nutrition. If they are sick, she persuades them to go to the hospital not the traditional healer. She says the challenge is that people change little by little, she said the easiest thing to change in communities has been open defecation but handwashing is difficult– people come from the field and feeding children with dirty hands and don't wash their hands before breast feeding. She found that people who haven't had an education are the least willing to change – at school the children learn and it's easier to change their habits. Some people still have bad habits like urinating in the bath houses. Some people are still sharing toilets. In-laws cannot use the child's toilet.	
1st Dec 2017	Mwakhundi	Doubt was described as having some learning and physical difficulties – he does not speak. When he was little Doubt fell into a pit latrine and is now afraid of the latrine. He shits behind the toilet and his mum (Chrissy) uses a hoe to pick up the shit and put it in the toilet. His mum was at the hygiene training and is on the Village Water Committee, so she knows it's important to stop defecating in the open. Although a neighbour complained that sometimes the shit is left in a big pile for a long time.	 

Date	Village	Who was visited / met	Photo (permissions given to take and use the photo and tell the story)
1st Dec 2017	Mwakhundi	Lloyd (in the striped shirt) went to work in South Africa. Lloyd worked there as a cleaner. He is also a house builder. When he came back to the village his wife told him about the project and he built the toilet. It took him 2 days to dig the pit and 2 days to build the superstructure. It cost him 5,000 KW for the bricks and 500 KW to pay for the slab.	
1st Dec 2017	Mvemve	Anthony didn't know that you had to use a latrine when you wanted to defecate until he attended the hygiene training. Now he uses a latrine. He also learned that he should wash his hands with soap and cover food. Anthony didn't pay for the latrine slab but he had to pay someone to dig the pit. His mum did piece work to pay for the work. He didn't ask neighbours for any help to dig the pit or build the roof and no one offered to help him. Before having the latrine he used to go to the field to defecate –this was difficult for him because he had to hide from the village children - it is shameful to be seen defecating. Anthony doesn't have a bath house and so he has to bath at night when no one can see him. His mum goes to collect water for the household but she is old and cannot carry much – he doesn't always have enough to drink	 

Annex K Logframe target assessment

OUTCOME	Outcome Indicator 1	Planned t~~t~~arget ~~- December 2017~~	Status December 2017	Consultant assessment of achievement
Men, women and children in target communities in Malili, Malawi have increased safe access to potable drinking water, improved sanitation and better hygiene that are sustainably managed, and thus are protected from water borne disease.	Number and percentage of under-fives who have experienced one or more episodes of diarrhoea within the past two weeks	208 (104U5B; 104U5G) ~~(13%)~~	54	Unlikely to be achieved
	Outcome Indicator 2	Planned target ~~Target - December 2017~~	Status December 2017	Consultant assessment of achievement
	Number and percentage of population drinking potable water	8,500 (2100M; 2600W; 1100B; 1100G; 1600I) ~~(100%)~~	7,723	Within 10% of target
	Outcome Indicator 3	Planned target ~~Target - December 2017~~	Status December 2017	Consultant assessment of achievement
	Number and percentage of population not practicing open defecation	6,375 (1575M; 1950W; 825B; 825G; 1200I) ~~(75%)~~	6,978	Achieved
	Outcome Indicator 4	Planned target ~~Target - December 2017~~	Status December 2017	Consultant assessment of achievement
	Number and percentage of population washing hands with soap or ash after defecating	6,375 (1575M; 1950W; 825B; 825G; 1200I) ~~(75%)~~	7,818	Achieved
	Outcome Indicator 5	Planned target ~~Target - December 2017~~	Status December 2017	Consultant assessment of achievement
	Number and percentage of women and girls who report having access to sustainably-managed sanitation facilities that offer privacy, dignity and safety*	3,330 (2340W;990G) ~~(90%)~~	3,300	Achieved

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OUTPUT 1	Output Indicator 1.1	Planned target ~~Target December 2017~~	Status December 2017	Consultant assessment of achievement
At least 2070 men, women and children from 50 villages participate in a hygiene awareness programme leading to an increased knowledge of improved water, sanitation and hygiene practices	Number and percentage of men, women, boys and girls participating in CLTS and PHAST awareness course	2,070 (630M; 780W; 330B; 330G) ~~(30%)~~	3,403	Achieved
	Output Indicator 1.2	**Planned target ~~Target December 2017~~**	**Status December 2017**	**Consultant assessment of achievement**
	Number and percentage of men, women, boys and girls that state washing hands as a method of preventing the transmission of diarrhoeal disease	5,175 (1575M; 1950W; 825B; 825G) ~~(75%)~~	6,818	Achieved
IMPACT WEIGHTING (%)	**Output Indicator 1.3**	**Planned target ~~Target December 2017~~**	**Status December 2017**	**Consultant assessment of achievement**
20	Number and percentage of men, women, boys and girls that state defecating in a latrine as a method of preventing the transmission of diarrhoeal disease	5,175 (1575M; 1950W; 825B; 825G) ~~(75%)~~	6,566	Achieved

OUTPUT 2	Output Indicator 2.1	Planned target ~~Target December 2017~~	Status December 2017	Consultant assessment of achievement
Over 1800 household latrines and hand washing facilities constructed, with additional assistance provided to vulnerable households, leading to access to improved sanitation and hygiene for all	Number of improved sanitation facilities constructed	1,880 (188 for vulnerable HH) ~~(100%)~~	1,811	Within 10% of target
	Output Indicator 2.2	**Planned target ~~Target December 2017~~**	**Status December 2017**	**Consultant assessment of achievement**
	Number of hand washing facilities constructed	1,880 (188 for vulnerable HH) ~~(100%)~~	1,787 (280 vulnerable)	Within 10% of target
IMPACT WEIGHTING (%)	**Output Indicator 2.3**	**Planned target ~~Target December 2017~~**	**Status December 2017**	**Consultant assessment of achievement**

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30	Number and percentage of population with access to improved sanitation and hand washing facilities	8,500 (2100M; 2600W; 1100B; 1100G; 1600I) ~~(100%)~~	8,083	**Within 10% of target**

OUTPUT 3	**Output Indicator 3.1**	**Planned target ~~Target - December 2017~~**	**Status December 2017**	**Consultant assessment of achievement**
50 water points constructed, leading to access to potable drinking water for all	Number of water points constructed that provide potable water	50 ~~(100%)~~	48	**Within 10% of target**
IMPACT WEIGHTING (%)	**Output Indicator 3.2**	**Planned target ~~Target - December 2017~~**	**Status December 2017**	**Consultant assessment of achievement**
30	Number and percentage of population with access to potable water resource	8,500 (2100M; 2600W; 1100B; 1100G; 1600I) ~~(100%)~~	7,723	**Within 10% of target**

OUTPUT 4	**Output Indicator 4.1**	**Planned target ~~Target - December 2017~~**	**Status December 2017**	**Consultant assessment**
Water pump repair service established, leading to increased water point sustainability of Water Works' 94 water points	Number of male and female members of village water committees	500 (250 M; 250 F) ~~(100%)~~	483 (241 M, 242 F)	**Within 10% of target**
	Output Indicator 4.2	**Planned target ~~Target - December 2017~~**	**Status December 2017**	
	Number of village water committees trained on water pump maintenance and the establishment of a community collection system to pay for water pump repairs	50 ~~(100%)~~	49	**Achieved**
	Output Indicator 4.3	**Planned target ~~Target - December 2017~~**	**Status December 2017**	-
	Number of village water committees collecting money on a monthly basis to pay for water pump repairs	35 ~~(70%)~~	34	**Achieved**
IMPACT WEIGHTING (%)	**Output Indicator 4.4**	**Planned target ~~Target - December 2017~~**	**Status December 2017**	-
20	Number of water points functioning, including those previously constructed by Water Works	60 ~~(64%)~~	55	**Within 10% of target**

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Annex L Documents Reviewed

Google Drive Folder	Document
General	Government of Malawi (2012) The Sustainability Check report. Ministry of Irrigation and Water Development, Lilongwe, Malawi. Government of Malawi (2012) Sector Performance Report 2011/12. Ministry of Irrigation and Water Development, Lilongwe, Malawi. Government of Malawi (2011) Open Defecation Free (ODF) Malawi Strategy 2011-2015, MoIWD, Lilongwe, Malawi. Government of Malawi (2008) National Population and Census Report. National Statistical Office, Zomba, Malawi. Government of Malawi (2008) National Sanitation Policy. Ministry of Irrigation and Water Development, Lilongwe, Malawi. Government of Malawi (2008) Water and Sanitation Sector Joint Sector Review Report. Ministry of Irrigation and Water Development, Lilongwe, Malawi. Government of Malawi (2005). National Water Policy. Ministry of Irrigation and Water Development, Lilongwe, Malawi. Government of Malawi (2004). Malawi Demographic and Health Survey. National Statistics Office, Zomba, Malawi. Government of Malawi (1995). Water Works Act. Lilongwe, Malawi. RWSN ***(****Rural Water and Sanitation Network****)*** and SKAT ***(****Swiss resource centre for development****)***: "The Rope Pump Concept" (2005)**:** http://www.rwsn.ch/documentation/sk... Malawi Government (2015) Open Defecation Free (ODF) Malawi, 2015, Strategy Document, September 2015 Malawi Government (2008) National Sanitation Policy, December 2008 Jones. H.E., Singini, W., Holm, R.H., & White, S (2016) CLTS Plus – making CLTS ever more inclusive, 39th *WEDC International Conference*, Kumasi, Ghana, 2016 Holm, R (2016) *Can Community-Led Sanitation be more inclusive of the needs of people with disability: A case study from Malawi*, Centre of Excellence in Water and Sanitation, Mzuzu University, P/B 201, Mzuzu 2, Malawi, 13 September 2016 [*prepared for the GSF EQND workshop*] White, S Danquah, L, Jones, H, Itimu-Phirir, A, Holm, R, Chinga, J and Biran, B (2016) Making-Community-led Total Sanitation More Inclusive, *WASH Futures Conference, 2016*, Brisbane White, S, Kuper, H, Itimu-Phirir, A, Holm, R and Biran, A (2016) A qualitative study on barriers to accessing water, sanitation and hygiene for disabled people in Malawi, *PLOS One*, DOI:10.1371/journal.pone.0155043, May 12, 2016
INN-077	UK Aid Direct Annual Review UKAD-INN-077_AR Narrative Report_Water Works_2017.10.01.pdf UKAD-INN-077_Logframe_Water Works_2017.10.01.xlsx Water and Sanitation in Rural Malawi - **KVZE-Q2SE-YX** UKAD-INN-077_Annex 4 Asset Inventory List_Water Works_2017.10.01.pdf UKAD-INN-077_Annex Due Diligence response_Water Works_2017.10.01 AR Document Checklist UKAD Forecasting FY1718_UKAD-INN-077_Water Works UK Aid Direct Grant Holder Quarterly Compliance Statement_Q1_2017-18_UKAD-INN-077_Water Works UKAD AR Financial Report_UKAD-INN-077_Water Works_2016.12.09 Receipts DFID Audit Advance Claim Form_2016-17_Q2_Water Works_UKAD-INN-077_v2 Advance Claim Form_2016-17_Q2_Water Works_UKAD-INN-077_v2(2) Advance Claim Form_2016-17_Q2_Water Works_UKAD-INN-077 UKAD Narrative AR Report_UKAD-INN-077_Water Works

	UKAD AR Sections 2_3_UKAD-INN-077_Water Works Knowledge, Attitude and Practice (KAP) Survey on Water, Sanitation and Hygiene in Ten Villages in the Lilongwe District of Malawi (2014) Project Plan Water Works DfID UK Aid Direct CP1 Budget Water Works revised UK Aid Direct Community Partnership Water Works 1
Village Stories	Mmezela – Chrisy Kwayela - Maliro Chimzimu - Gezina
Rope pumps	Parts tracking
Well Repair service	WASH feedback 2 Well reparation logbook
Water Pump repair test	Water Works Receipts and Payments Book - Tables 2017 Water Works Receipts and Payments Book – Tables WW Repair Service Business Plan
Water Committee	Water Committee Accounting Book_Instructions 2015.11.04 Water Committee Accounting Book_Instructions 2017.04.06 Water Committee Accounting Book_Tables 2017 Water Committee Accounting Book_Tables_2016.05.10 Water Committee Accounting Book_Tables_Chichewa_2017.01 Water Committee Accounting Book_Tables_Chichewa Water payment form Chichewa Water payment form English Accounting Book_40 Households Accounting Book_80 Households Accounting Book_120 Households
KAP Survey	KAP Survey_2016.11.23 Personal Story
Village level PME	Material Tracking – new Material Tracking Village Level PME_2016.05.25 Village Level PME_2017.04.02
MoU partnership Employment	Partnership Agreement - Annex C - Work Plan Warning Letter
Job description	JD_Programme Manager_2017.01.25 JD_Team Leader
Invoices	Invoice Template Construction Team Invoice Template_International Staff_Daily Rate_2017.03 Invoice Template_Management Team_Daily Rate_2015.10.20 Invoice Template_Management Team_Monthly Rate_2015.10.20 Invoice Template_National Staff_Monthly Invoice Template_National Staff_Monthly
Partners and coordination	WW PRDO MoU revised Draft Gender Policy for Mzuni 3 August 2015 Information requested by SMART Centre - April 2017 Due Diligence Check on Ministry of Health Notes Water Works and Lilongwe District Council Rope Pump Training Attendance Malawi 4W_s_WASH Cluster_2016.10.21
Reports	**2015-1016** Advance Claim Form_Q1_UKAD-INN-077_2016.04.25 Advance Claim Form_Q1_UKAD-INN-077_2016.04.25 Arrears Claim Form_Q4_UKAD-INN-077 Compliance Statement_Q4_UKAD-INN-077

	2016-2017 UKAD AR Sections 2_3_UKAD-INN-077_Water Works UKAD Narrative AR Report_UKAD-INN-077_Water Works UKAD AR Financial Report_UKAD-INN-077_Water Works_2016.12.09 Advance Claim Form_2016-17_Q2_Water Works_UKAD-INN-077 **2017-2018** UKAD-INN-077_Annex 4 Asset Inventory List_Water Works_2017.10.01 UKAD-INN-077_Annex Due Diligence response_Water Works_2017.10.01 AR Document Checklist UKAD Forecasting FY1718_UKAD-INN-077_Water Works UKAD Forecasting Template FY1718 UK Aid Direct Grant Holder Quarterly Compliance Statement_Q1_2017-18_UKAD-INN-077_Water Works UK Aid Direct Independent Final Evaluation Guidance - Coffey Jan 2016 Grant holder scoring guidance PCR AR
PME	**2015** Well reports 2015.10.13 Personal stories A story of a woman at Msenda village Case Study Kammayani CHIPHAZI Kadala Mmachilika mbang Personal Story_Kauma Personal Story_Kauma Personal Story_Msenda Rhoda Jameson 23 years old comes from Kazimba village in TA Maliri sekina story! **Operational Plan** Operational Plan 2016.03.13 Operational Plan 2016.03.12 Operational Plan 2016.01.03 Operational Plan 2015.12.16 Operational Plan 2015.12.15 Operational Plan 2015.12.01 **2016-2017** Baseline Survey Interviewee_s KAP final report 2013 KAP Surveys Completed KAP Village ID Life story - Ntchele Saidoni Project Time Plan Tasks Remaining_2017.01.17 Water Point Functionality Survey_2016.11.23 Hygiene Work Plan_2016.03.30 **2017-2018** Water Quality Testing 2017-04-10 Water Point Functionality 2017-04-12 Project Time Plan 2017 KAP Surveys Completed 2016 Operational Plan_2017.07.04 ODF Certificate_Chechewa_ndala ODF Certificate_Chechewa_nathamanga kamende

	ODF Certificate_Chechewa_mphanda ODF Certificate_Chechewa_mpanje ODF Certificate_Chechewa_Mmezela ODF Certificate_Chechewa_kwayera ODF Certificate_Chechewa_kambewa ODF Certificate_Chechewa_henock ODF Certificate_Chechewa_Chikhawo ODF Certificate_Chechewa_chidelu ODF Certificate_Chechewa_chidatha ~$Operational Plan_2017.09.18 Operational Plan_2017.04.07 Operational Plan_2017.08.02 Project Time Plan 2017 - HSA scheduling – superceded Village List - for MOH Mbawa Village List - superceded
	WEDC poster Edinburgh Water Works Abakus Pump Handout Cohen_ 2010 Thesis Final Thesis Write Up 21st Grupka_ 2012 Monitoring scheme gender Hygiene Education Water Works Endline Form Water Works Final Sheet1 Baseline Form Water Works Final Abakus Pump Diagram Stakeholder Meeting
Policies	Code of Conduct Water Works Due Diligence Policy Equal Opportunities Policy Finance Policy 2015.05.19 Policy on human resources M and E Policy and Process Conflict Sensitivity Analaysis UKAD-INN-077_Risk Matrix _2017.01.09 Risk re Business Continuity Risk Assessment Poverty Impact policy on whistle blowing WW
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