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A qualitative assessment of disability friendly water and sanitation facilities in primary schools, Rumphu, Malawi

Harlod Zaunda
Mzuzu University

Rochelle H. Holm
University of Louisville

Ambumulire Itimu-Phiri
Mzuzu University

Mphatso Malota
Mzuzu University

Sian White
London School of Hygiene & Tropical Medicine

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Abstract

Students with disabilities commonly face barriers when accessing water and using sanitation and hygiene facilities at schools. International frameworks have prompted governments to enact local policies that enshrine these rights, guarantee equitable education access, and mandate inclusive infrastructure. This research was designed to explore whether Malawi has translated good policies into practice. Data were gathered in Rumphi District, Malawi, through structured field observations in ten schools and interviews with students with a disability (n=23), teachers (n=11) and government stakeholders (n=2). No school had facilities that fully meet the needs of students with disabilities, and private schools were not necessarily better. The cost of bringing existing infrastructure up to standards was on average MK54 000 (USD\$78). However, proactive consultation with children with a disability is likely to generate alternative low-cost short-term solutions. Increased government support, budgeting and enforcement is necessary to ensure international standards and national policies are met.

Keywords: children, developing countries; disability; water, sanitation and hygiene; education

1. Introduction

The Sustainable Development Goals (SDG) committed the world to providing equitable education (Goal 4) and water and sanitation for all (Goal 6) (United Nations, 2016). This paper looks at the interconnectedness of these goals. It focuses on the institutional water, sanitation and hygiene (WASH) needs of children with disabilities and the challenges of closing the gap between policy and practice in low-resource settings.

Students with a disability are much more likely to be marginalized by the education system, with much higher drop-out rates and lower levels of literacy (Groce & Bakhshi, 2009). This is particularly pronounced in low and middle-income countries (LMIC) where it is estimated that less than 5% of children with disabilities attend school (Peters, 2003). A review, conducted in 2016, summarized some of the barriers that contribute to this statistic: a) many LMIC are still in the process of scaling up universal education and do not see it as a priority to support the needs of children with a disability; b) making schools more disability-friendly isn't seen as cost-effective; c) national policies are adopted symbolically and do not clarify how to translate rights-based principles into tangible actions; and d) those at the lowest level, who are in the best position to make change, do not have sufficient capacity or resources to do so (Wapling, 2016).

Safe and dignified access to water, sanitation and hygiene is one of the major challenges that people with disabilities face in their day to day lives (White *et al.*, 2016). Groce *et al.* (2011) suggested that people with disability face three types of barriers when accessing WASH: physical (e.g. muddy paths, narrow doors, steps, etc.), social (e.g. stigma and beliefs towards people with disability) and institutional (e.g. policies and practices that overlook the needs of people with disabilities or prevent their participation). A recent study in Malawi identified 50 barriers that people with disability face when accessing WASH, many of which are relevant to both children and adults (White *et al.*, 2016). Child and disability friendly WASH guides do exist to overcome these barriers. For example, Jones and Wilbur (2014) provide a range of accessible WASH technologies that utilize local materials and are appropriate for LMIC. Additionally, the World Bank (2017a) has guidelines for including persons with disabilities when designing publically accessible water infrastructure.

Malawi is one of the world's poorest nations but a push in recent years has led to 97% of children being enrolled in primary education (World Bank, 2017b). An estimated 2.4% of youth in Malawi have a disability (UNICEF, 2013), and for these individuals school attendance remains much lower than the national average. A study by UNICEF (2013) found that this inequity is predominantly due to the physical school environment not being sensitive to the needs of people with disabilities.

Malawi's national policies are clear on the importance of equitable access to WASH in schools. The National Sanitation Policy states that the nation should 'provide and maintain improved sanitation facilities, which also cater for people with special needs in all public places' (Malawi Government, 2008). Specifically, the policy states that 'at least one latrine or toilet for boys and girls in all schools is provided with facilities for pupils with disabilities.' The National Water

Policy also encourages inclusivity and states that there should be ‘active participation of youth, women, persons with disabilities and vulnerable persons in planning and implementation of rural water supply and sanitation activities’ (Malawi Government, 2005). Additionally, the Malawi National Policy on Equalisation of Opportunities for People with Disabilities promotes the education and training of persons with disabilities and pledges ‘to send children with disabilities to school’ and also to ‘make water and sanitation services and facilities more inclusive and accessible for disabled people’ (Malawi Government, 2006). However, the Disability Act (Malawi Government, 2012) does not make the institutional provision of inclusive WASH legally binding.

In 2013, Erhard *et al.* conducted an initial exploratory case study on WASH in schools in Malawi. Despite the policy provisions outlined, they found that WASH facilities were sub-standard nationally, but that the needs of children with disabilities were particularly being overlooked. In 2013 there was no national tracking or assessment of disability friendly WASH facilities in schools and unfortunately this situation has not changed. This study is therefore designed as a follow up to the work of Erhard *et al.* (2013). It will explore whether Malawi has translated existing policy into practice and, if not, identify remaining barriers to inclusive WASH access in schools.

In this paper ‘children with disabilities’ are defined as:

girls and boys with long-term physical, mental, intellectual or sensory impairments which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others (Age and Disability Consortium, 2015).

2. Methods

2.1 Study Site:

This study was conducted in ten primary schools in Rumphi town, in northern Malawi, from January to July 2016. Rumphi town had a 2006 projected population of 22 594 (Rumphi District, 2009). Rumphi district has a literacy rate of 86%, higher than the national average (Rumphi District Assembly, 2009). Information about students with disabilities in the region is inconsistent. According to the Ministry of Education, as of 2015 Rumphi district had 1 601 primary school children with special learning needs among 194 district wide schools (Malawi Government, 2016). But in 2009 the district reported 214 persons (adults and children combined) with disability registered with the Social Welfare Department (Rumphi District Assembly, 2009). Within Rumphi town there are seven public and three private schools. The local government of Rumphi has made some initial steps on disability-inclusive household WASH (Jones *et al.*, 2016). The seven public schools receive funding from the government for day-to-day operations such as infrastructure and salaries while the remaining three private schools do not get any financial or infrastructural support from the government. At a local government level, monitoring the accessibility to education is based on travel time to school of less than 3 km (Rumphi District, 2009).

2.2 Data Collection:

The study involved observations of WASH facilities at all ten primary schools in Rumphu town, and interviews with students with a disability, teachers and key stakeholders. Interviews and WASH facility observations at the schools were based upon the World Health Organization's (WHO) WASH standards for schools in low-cost settings (WHO, 2009) and focused on availability of facilities sensitive to the needs of people with disabilities, noting distances, dimensions and visual observations about facility condition and through asking about management processes. Interviews were undertaken with formally trained special needs teachers. Where such a person did not exist a senior member of the teaching staff was interviewed. These teachers then provided a list of all students with disabilities at their school. Purposive sampling was utilized to ensure that the sample was diverse in terms of age, impairment type and gender. Written consent was sought from the teachers of each of the students and assent was provided by each student. A maximum of four students per school were selected, however, one school did not have children with disabilities, in which case no student interviews could be conducted. District officials, involved in the education system and the provision of WASH services were also interviewed.

Interviews were recorded, transcribed and anonymized. Observational data was recorded on a checklist and analyzed descriptively. Data was coded by hand based on an *a priori* framework which disaggregated water, sanitation and hygiene barriers, ways of coping and awareness of accessible technologies.

Ethical approval for the project was obtained from the Republic of Malawi, National Commission for Science and Technology (Protocol No. P.11/15/65).

3. Results

A total of 23 students (12 male and 11 females, 6 to 18 years old) with visual, physical and/or cognitive impairments participated in the study as well as 11 teachers and two local government representatives.

3.1 Accessible water facilities

About half (11/23) of the students with disabilities described facing problems with accessing drinking water at their school. Two types of barriers were described by these students: (1) the pathways to/from the water source were uneven and (2) the design of the school handpump made it difficult for them to operate. Students described two ways of coping with these barriers: (1) getting friends to help, (2) keeping quiet, and (3) tolerating the discomfort caused by the barriers.

3.1.1 Barriers

Field observations found that the quality of water source infrastructure (piped water and/or handpumps) available at the primary schools was poor in general (Table 1). Two schools had no water sources available and the majority had handpumps only. Private schools had better quality facilities with all three having piped water. Nearly half (4/10) of the water sources were located more than 30 m from the classrooms, with some as far as 350 m. None of the ten schools had an access ramp and in 70% of the surveyed schools the path to the water source

was uneven (e.g. the ground was uneven or lined with stones). None of the schools had supporting rails leading to the water source, and four schools had steps leading to the water source. No school had water facilities in the shade (to help children with albinism). Among the schools with handpumps, the platforms ranged in size from 2 to 4 m², which is an insufficient turning radius for a wheelchair user to enter and turn around. The pumps were all Afridev handpumps (Figure 1a), which are common throughout Malawi. Piped water sources were not necessarily more accessible as some were placed too high (e.g. 1.2 m). Four schools had a pedestal near the water source that could be used as a seat.

Children with disabilities described the terrain or pathways to the water points as the major water access barriers (6/23; 26% mentioned this):

'Paths to the pump - I can't see properly if there is too much sunlight and cloud cover'

(Child with visual impairment)

'The paths are not levelled and have stones which I can't see properly.'

(Child with visual impairment)

Fewer (4/23; 17%) of the children also mentioned that the design of the water source made it difficult for them to use:

'It is difficult for me to operate the handpump handle,'

(Child with physical impairment)

[Insert Table 1 near here]

[Insert Figure 1 near here]

3.1.2 Ways of coping

Children were asked about how they dealt with these water access barriers. The most common response (6/13) was that the children had formed strategies of getting friends to help:

'I ask my friend to help me and use paths which are comfortable for me to walk.'

(Child with physical impairment)

Other answers included keeping quiet or avoiding the need to access water:

'I just stay quiet'

(Child with physical impairment)

'I bring water from home'

(Child with visual impairment)

Other children explained that they had learned to just tolerate the challenges:

'I cover my eyes with my hands when there is high intensity of light.'

(Child with visual impairment)

'I jump [to the water point] though it's painful.'

(Child with physical impairment)

3.2 Accessible sanitation facilities

The quality of sanitation facilities available at the primary schools was also poor in general (Table 1). Pit latrines were available at all schools. Distance from the classrooms to the pit

latrines ranged from 2 to 114 m. The WHO (2009) standards state that facilities should be no more than 30 m from all classrooms. The average distance at public schools was 54 m, whereas the average distance at private schools was 12 m. Only one school (public), had a dedicated sanitation facility sensitive to the needs of people with disabilities, which included a door, a raised seat made from local bricks (Figure 1b), and a ramp. Some pit latrines had no door. None of the schools had drophole covers. All (3) of the private schools had concrete floors, whereas less (5/7) of the public schools had concrete floors. None of the schools had supporting rails leading to the pit latrine and at 6/10 schools had steps at the entrance of the latrines. In all the schools, the latrine door width was less than 1 m, not wide enough for a wheelchair user to enter - forcing the user to leave it outside and crawl to use the facility. The pit latrine dropholes ranged from 0.2 m to 0.3 m in diameter. In addition to the pit latrines, six schools had urinals, however these were functional at only two schools. Others had deteriorating and blocked drainage systems, but were being used.

Only one school (public) had a handwashing facility near the toilet, but there was no soap present. None of the schools had toilet tissue on hand for anal cleansing or paper towels for hand drying.

3.2.1 Barriers

More than half (13/23) of the school children interviewed with disabilities said they experienced problems when visiting the school sanitation facilities. Two types of barriers were described by these students: (1) issues with cleanliness of the sanitation facility infrastructure, (2) the pathways to the facilities were difficult to navigate, and (3) privacy. The primary way of coping with these barriers was to drink or eat less to reduce toileting use.

Wet and dirty floors were the most common challenge the children encountered. This was observed in 8/10 schools and reported by 5/23 children interviewed. One child who currently needs to place his/her hands on the ground in order to access the toilet explained:

'My friends just piss everywhere, so it's difficult for me to urinate and defecate.'
(Child with a physical impairment)

Similar to the issues reported when accessing water, students also said that the pathways to latrines made them difficult to access:

'If there is high intensity of sunlight, I can't see properly [to get to the latrine]'
(Child with visual impairment)

Although not an issue that exclusively effects children with disabilities, the limited privacy at the sanitation facilities was raised as an issue:

'There is no door so I become afraid that other people might see me'
(Child with a visual impairment)

In this child's case the absence of a locking door was more unsettling than for the average student because they were unaware of whether other students were watching them.

3.2.2 Ways of coping

When asked about how they deal with the barriers to sanitation access, many (43%; 10/23) children reported reducing their food and liquid intake to decrease their need to use latrines

during the school day. Children reported they normally would not talk about the sanitation difficulties they faced. In contrast to the coping strategies used to overcome water access barriers, getting teachers or friends to help with sanitation access was not commonly reported.

3.3 Management of water and sanitation facilities sensitive to the needs of people with disabilities

At public schools, maintenance of facilities was the responsibility of School Management Committees, comprised of parents of the students who form a committee and choose representatives. In practice, this meant that there was a roster of students responsible for cleaning the sanitation facilities on a daily basis. Whereas, in private schools, maintenance was the responsibility of the school owners and performed by a hired cleaner, not the students. Based on observations and comments from students with disability, utilization of a hired cleaner tended to result in cleaner latrines. Though beyond visual solid material, sanitizing should be the target during cleaning.

In public schools, the parents pay MK500 (less than USD\$1) annually towards operation and maintenance for the school (for both WASH facilities plus general school maintenance). This is a relatively substantial commitment given the national minimum wage is MK 18 000/month (USD\$36/month). Apparently, the funds are insufficient or not a priority in the public school.

3.4 Awareness of accessible infrastructure

Key stakeholders and teachers and children were interviewed about their awareness of accessible infrastructure. Key themes that emerged were: (1) students were unwilling to discuss WASH access issues which meant these needs were overlooked by key stakeholders and teaching staff, (2) overlooking the potential to adapt existing facilities, and (3) lack of consultation of students with disabilities or special education teachers.

3.4.1 Unwillingness of students to discuss WASH access issues

While conducting interviews with students, the research team realized that students struggled to articulate the difficulties they faced. For some this was borne out of a sense of embarrassment, while for others it was due to a normalization of these challenges. For example, at one school, a girl with a visual and physical impairment said she did not encounter problems when going to the handpump to collect water. However, the researcher observed that she faced substantial difficulties navigating the uneven path. Since this student probably collects water on a daily basis, what looks difficult to the researcher is now normal for the student. In the absence of students discussing these issues, teachers tended to assume that WASH access must not be a significant need among children with disabilities:

'They are using WATSAN {water, sanitation and hygiene} services e.g. toilets, taps the same as their friends. There is no difference except for one girl who has cerebral palsy and one boy has short arms and can touch the ground when using these services and his friends help him since he can't walk and they do escort him.'

(Teacher at a public school)

'It's [WASH access problems for children with a disability] not excessive. They walk with problems to the toilets and drinking water facility but they are able to walk by themselves'
(Teacher at a public school)

3.4.2 Overlooking the potential to adapt existing facilities

Government stakeholders, teachers and students did not recognize the potential to adapt existing facilities and were unaware of potential low-cost technologies (Table 2). Teachers were primarily interested in building new inclusive infrastructure in their schools rather than considering how their existing infrastructure could be adapted to become more accessible. The two local government officials also referenced new infrastructure and the importance of community mobilization around WASH and disability issues.

3.4.3 Lack of consultation

The interviews with teachers revealed that making WASH facilities accessible for their students with disability was not a priority and that there had never been any proactive consultation with students on this topic. Rather than seeking the views of students, teachers thought that consultation with health care professions, the student's parents or school management would yield the best information about the student's WASH needs:

'If we were to enroll a child with a disability, we can just visit the hospital for them to help us with a wheelchair or any movement aid...If a child with disability is enrolled and provided with wheelchair by the hospital; we can just ask his or her parents about his/her problems. Or ask the owner of the school to decide on what he or she can do'
(teacher in a private school)

These quotes also suggest that teachers conceptualize disability relatively narrowly (i.e. that disability normally refers to a wheelchair user). Neither of the district representatives suggested asking children with disabilities about their needs either.

However, the interviews with children with disabilities demonstrated the ability of these students to come up with practical solutions to the challenges they faced. The most commonly requested solutions were: keeping facilities clean, adding doors for privacy, reducing the height of steps or replacing these with a ramp, replacing handpumps with piped water sources and moving the facilities closer to the classrooms.

Most public schools (86%; 6/7) had trained special education teachers, of which one school had two special education teachers. Out of the three private schools in our study, there was no special education teacher that had received formal training. Within the Malawian educational system, special education teachers are a resource for a wide range of learning support. In some public schools, special education teachers had been trained in accessible WASH. These teachers said that the local culture of respecting hierarchy, often meant that they were unable to translate this expertise into action within their school. One special education teacher respondent said:

'Since in the past people didn't understand disability and WASH, therefore these things have just been introduced as few people know about these things. And we, special

education teachers, report to the headmaster...but there is resistance from the headmaster since they thought we're changing or disturbing things at the school and they said they will look into it.'

(teacher in a public school)

Three of ten teachers interviewed and one of the government representatives felt that teachers had an important role to support students in accessing WASH facilities. Yet none of the students reported that they had ever sought direct support from teachers, instead they relied primarily on their peers.

[Insert Table 2 near here]

3.5 Options to adapt existing facilities

An assessment was done by going to the local market and asking for the costs of key items to adapt existing sanitation facilities by utilizing local materials available from the study area, such as placement of local branches as a pathway marker or seat support, wooden drophole covers, adding a door, building a raised seat made from earth bricks and widening the doorway.

Cost calculations to adapt existing sanitation facility school infrastructure up to the WHO standards (calculations by the first author [HZ]) using local materials from within the study area indicate a minimum of MK28 000 (USD\$40) to a maximum of MK74 600 (USD\$107) (median MK54 000 [USD\$78]) (Table 3).

As for water sources design improvements, the most commonly mentioned by children (17%; 4/23) was to move from handpumps to piped water (Figure 1c), which would result in a high initial and long term operational cost for the school.

[Insert Table 3 near here]

4. Discussion

In 2013 Erhard *et al.* documented that school sanitation facilities did not yet meet the needs of children with disabilities in Malawi, despite advances in policy and local guidelines. Five years on, this research finds that the situation has not substantially changed and that water and hygiene provisions at schools are also not accessible for students with a disability.

Improving the inclusivity of WASH facilities is challenging in low resource settings where the availability and quality of WASH facilities in schools remains sub-optimal in general. However, this can also be viewed as an opportunity. Many of the technologies that would improve access for students with a disability would have benefits for all students (e.g. locking doors, clean cemented surfaces, improved pathways, handwashing facilities and piped water access) and could easily be incorporated into the building of all new facilities. Findings from this research also indicate an array of 'easy-wins' that could be achieved by employing low-cost, locally made adaptations to make existing facilities more inclusive. Currently none of the schools in the study area met the WHO standards but it was found that it would be relatively affordable to improve them to this standard.

By garnering perspectives from students, teachers and government stakeholders this research has identified four key barriers preventing policy from being translated into practice:

1. Policy changes have increased the number of special needs teachers available in public schools but such positions are not commonly being created at private schools, resulting in an expertise gap and a lack of accountability for such schools to provide inclusive infrastructure.
2. Special needs teachers have a wide mandate and receive only a limited amount of training on inclusive WASH facilities. These time and training limitations coupled with the hierarchies of the education system dissuade teachers from being able to bring about change in this area. Chitiyo *et al.* (2015) found that teacher training programs in Malawi require at least one special education course/module. A recommendation emerging from this research would be to strengthen this component and incorporate inclusive WASH training as part of the national teacher training curriculum so that all teachers are aware of potential barriers and solutions for learners with a disability. Ideal curriculum topics would include how to consult students with a disability about their needs and how to adapt existing school infrastructure using low-cost locally available resources. Teachers who do manage to make changes to facilities, with the limited resources available to them, should be recognized and provided incentives such as the opportunity to visit other schools and share their expertise.
3. Disability is still conceptualized narrowly in Malawi, with the medical model of disability prevailing in discourse and practice. This has resulted in the greatest resource for potential WASH solutions being overlooked and rarely consulted - the students with disability themselves. As a consequence, the burden of WASH access is underestimated and normalized by teachers and government stakeholders. Although this research focused on the availability of physical infrastructure, it has revealed that numerous social barriers also need to be overcome (e.g. addressing stigma and creating spaces and methods which enable open conversations about the WASH needs of all pupils).
4. The lack of national standards and monitoring on WASH infrastructure for schools may have added to a lack of decisive effort by school authorities on how to put policy into practice. Although this research found that the cost of improving facilities to the WHO standard was relatively small, in a resource limited setting this is still substantial and there are no stipulations about who should bear this cost.

5. Study Limitations

Many students didn't respond to interview questions. This may have been a weakness of the methods (e.g. they need to be adapted to more effectively elicit responses from children). Alternatively, it may reflect the social norm where WASH access issues are normalized and thus children are unused to being asked about such matters and less able to articulate the barriers they face.

Though the number of schools included in this research was small, the study covered all primary schools in the town and through interviews with students, teachers and government stakeholders we were able to achieve a degree of saturation among their responses.

This research did not involve parents, yet family members are likely to have an important role to play in terms of championing the needs of their children and contributing to committees that may be central to realizing change.

6. Conclusion

Although Malawi is the focus of this research, the situation described in this research is likely to be consistent with many low resource settings. The value of a nation, like Malawi, enacting policies that state the rights of people with disabilities, should not be underestimated. Yet this is rendered meaningless if these rights are not afforded in practice. This research found that over the last five years limited progress has been made on inclusive WASH access in schools. Our observations indicate that the WHO standards may be too ambitious for low and middle-income countries to achieve right away. Instead, low-cost adaptations, such as those described by Jones and Wilbur (2014) may be a crucial stepping stone to achieve short term change. In the case of Malawi, government and community based action is required. The onus is on the Government to put in place realistic national standards, train teachers and government officials on these, monitor them, recognize individuals and schools that have been able to bring about change, and ultimately to develop a funding strategy to help schools improve their facilities. This research highlighted the important role that community-based committees and structures should play in bringing about change and that proactively consulting children with a disability can generate a range of appropriate and affordable infrastructural improvements.

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Table 1. Results of accessible school water, sanitation and hygiene facilities in study schools.

Indicator	Public School % (n=7)	Private School % (n=3)
Sufficient toilets — one per 25 girls and one for female staff; one toilet plus one urinal (or 50 cm of urinal wall) per 50 boys, and one for male staff	14% (1)	0% (0)
Toilets are easily accessible to all, including staff and children with disabilities — no more than 30 m from all users with male and female toilets separated	14% (1)	0% (0)
Toilets provide privacy and security — presence of walls and doors (not necessarily locking)	43% (3)	33% (1)
Toilets are appropriate to local cultural and social conditions, are age and gender appropriate and accessible for children with disabilities or suffering from chronic diseases (i.e. toilets are child friendly) — indication toilets are able to be accessed by children with disabilities at the time of the site visit	29% (2)	0% (0)
Toilets are hygienic to use and easy to clean – no presence of flies, feces, urine or wet floors	0% (0)	0% (0)
Toilets have convenient handwashing facilities close by — presence of water (not necessarily soap)	14% (1)	0% (0)
A cleaning and maintenance routine is in operation, ensuring that clean and functioning toilets are available at all times	100% (7)	100% (3)
Reliable water point in the school — indication of water available at the time of the site visit	71% (5)	100% (3)

Checklist adapted from World Health Organization (2009)

Table 2. Suggestions to promote accessible school water, sanitation and hygiene facilities

Suggestions from the local government (n=2)	Suggestions from teachers (n=11)	Suggestions from children with disabilities (n=23)
<ul style="list-style-type: none"> • Construction of facilities should be initiated by community members • Use school sanitation clubs to assist with daily care of facilities • Encourage learning visits to other schools • Use the district water office for technical support • Train special education teachers in each school 	<ul style="list-style-type: none"> • Increase number of buckets with taps near or in classrooms • Increase number of water sources • Provide ramps • Raise awareness of accessible pit latrine designs • Having a resource center for children with disabilities inclusive of WASH and other topics • Provide wheelchairs or gloves and glasses for children with disabilities • Place water sources closer to classrooms • Build new urinals • Improve paths to the pit latrines and water sources • Train general teachers on accessible WASH facilities • Ask the child's parents what to do 	<ul style="list-style-type: none"> • Place handpump handle at a reachable height • Place a cup for drinking at the water source • Provide shade at water sources and sanitation facilities • Use piped water, rather than a handpump • Clean sanitation facilities daily • Ensure presence of doors at each sanitation facility • Reduce step height at the facility entrance • Place kneepads and hand walkers at the pit latrines for children with leg and arm impairments • Build more pit latrines compared to school population

Table 3. Estimated cost to adapt existing sanitation facilities

	Public School A	Public School B	Public School C	Public School D	Public School E	Public School F	Public School G	Private School A	Private School B	Private School C
Infrastructure	Cost in MK									
Path marker	8821	1500	2500	2536	2981	6767	11375	717	2609	4
Ramp	4000	5000	0	7000	4000	3500	4000	0	5000	40
Steps	5000	3000	0	0	3500	0	7000	3500	2500	60
Entrance	2000	2000	5000	4500	12000	5000	10000	5000	4000	25
Presence of a door	200	0	0	100	400	2,00	100	100	100	1
Door handles	1000	1000	4000	4000	4000	4000	4000	1000	4000	40
Internal Space	10000	50000	40000	30000	0	20000	0	9000	35000	400
Raised Seat	1500	2000	2000	1500	1500	1500	1500	2000	1500	15
Handrails for support	3000	3000	3000	3000	3000	3000	3000	3000	3000	30
Handwashing station	3000	3000	3000	3000	3000	3000	3000	3000	3000	30
Clear paths	4000	0	4000	3000	2000	0	4000	0	0	90
Drophole cover	1000	1000	1000	1000	1000	2000	1000	1000	1000	10
Total	43521	71500	64500	59636	37381	48767	48975	28317	61709	745

Figure captions

Figure 1. Water and sanitation facilities in primary schools, Rumphi, Malawi: (a) Afridev handpump with uneven pathway and platform, (b) raised seat over the pit latrine squat hole made from local bricks and (c) municipal piped water tap.

