

**Inclusive Primary Education in Tanzania:
The role of Accessible Sanitation**

by

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Dedication



To Sukraj Sherpa
Gesarling, Dagana Dzongkhag, Bhutan

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The exchange rate assumed throughout this report is GB£1: Tsh 1500 (Tanzanian Shilling)

List of Abbreviations, Acronyms and Glossary

Accessible	In this report this will mean accessible to disabled children
AA	Accessibility Audit
Accessibility Feature	Any adaptation or accessory which facilitates accessibility by disabled people
(latrine/ sanitation) block	A set of latrine cubicles, sharing a pit, slabs etc typically in a row, but may also include handwashing, urinal or menstrual hygiene facilities
(door) bolt	Push fit door bolt, more commonly called a stopper in Tanzania
BEST	Basic Education Statistics Tanzania
BEST-AC	Business Environment Strengthening for Tanzania – Advocacy Component
BoQ	Bills of Quantities
CBO	Community Based Organisation
CCBRT	Comprehensive Community Based Rehabilitation in Tanzania
CHAWATA	Chama cha Walemavu Tanzania (Tanzania Association of the Physically Handicapped)
CRB	Contractor’s Registration Board, Dar es Salaam
CRC	Convention on the Rights of the Child 1989
CRPD	Convention of the Rights of Persons with Disability 2007
Cubicle	A single latrine compartment, with or without full height walls or doors.
CUD	Centre for Universal Design (US)
Developed/ Developing countries	As defined in the UN Human Development Index
DFID	Department for International Development (UK)
DPO	Disabled Persons Organisation
Drop Hole	(Dry) pit latrine
EFA (GMR)	Education For All (Global Monitoring Report)
E/O	The additional cost of construction for accessibility features, less the cost of standard facilities
Extra Over	
FRESH	Focussing Resources on Effective School Health. Partnership of UNICEF, UNESCO, WB, WHO
GoT	Government of Tanzania (i.e. Tanzania mainland only)
GTZ	German Technical Assistance (now GIZ)
HakiElimu	Right to Education - Tanzanian NGO
HIV/AIDS	Human Immunodeficiency Virus (Acquired ImmunoDeficiency syndrome)
HWB	Hand Wash Basin
Inclusive	Any facility or process which is accessible to disabled people
Inclusive school	A school which accepts disabled children into mainstream classes, and may or may not be formally recognised as such by MoEVT
INGO	International Non-Governmental Organisation
latrine	Used interchangeably with toilet

LCD	Leonard Cheshire Disability
LCD-IDG	Leonard Cheshire Disability, International Disability Group
LIC	Low Income Countries
Mainland	Mainland Tanzania, i.e. not including Zanzibar
Mainstream school	Any school which does not have integrated or special classes. Due to the fact that many schools accepting disabled children in the study have not been recognised by MoEVT, mainstream is used to identify these schools.
MAIR	MKUKUTA Annual Implementation Report
MDG	Millennium Development Goals
MKUKUTA	Mkakati wa Kukuza uchumi na Kupunguza Umaskini (also known as NSGRP) MKUKUTA I 2005-2010, MKUKUTA II 2010-2015
MoEVT	Ministry of Education and Vocational Training, URT
MoHSW	Ministry of Health and Social Welfare
MoLYS	Ministry of Labour, Youth Development and Sports
NBS	National Bureau of Statistics, URT
NCC	National Construction Council
NDS	2008 National Disability Survey
NFE	Non Formal Education
NGO	Non-Governmental Organisation
NG SWASH	National Guideline School Water, Sanitation and Hygiene (draft 2010)
NPD	National Policy of Disability (2004)
NSIE	National Strategy on Inclusive Education (draft 2010)
NSGRP	National Strategy for Growth and Reduction of Poverty, URT (also known as MKUKUTA)
O&M	Operation and Maintenance
PEDP/ PEDP II	Primary Education Development Programme (2001-2006) / Phase II (2007-2011)
PS	Primary Schools
QS	Quantity Surveyor
Sanplat	Sanitary platform, the floor construction of a latrine cubicle whether sanitary or not
SEDP	Secondary Education Development Programme
SHARE	Sanitation and Hygiene Applied Research for Equity
SNV/ SNV Tz	Netherlands Development Organisation/ Tanzania office
SS	Secondary School
SSHE	School Sanitation and Hygiene Education
(door) Stopper	Push fit door bolt
SWASH	School Water Sanitation and Hygiene
TENMET	Tanzania Education Network
Toilet	Used interchangeably with latrine
UCL	University College London, UK

UDHR	Universal Declaration of Human Rights 1948
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
UPE	Universal Primary Education
URT	United Republic of Tanzania i.e. Federal government of both Tanzania mainland (historically Tanganyika) and Zanzibar
VIP/ VIPL	Ventilated Improved Pit/ Latrine
WASH	Water, Sanitation and Hygiene
WA/ WATz	Water Aid/ Tanzania
watsan	Water and sanitation
WEDC	Water and Engineering Development Centre, Loughborough, UK
WEDC design - original	The latrine layout provided in Reed and Shaw (2008) Sanitation for Primary Schools in Africa
WEDC based/ modified design	WEDC designs adapted for use in NG SWASH or by Plan Tanzania
WHO	World Health Organisation

1 Introduction

This introduction provides the background for the research and why the study was conducted.

1.1 Motivation and Research need

Education and WASH have been recognised as central to many poverty reduction programmes though evidence shows that the sanitation component is often neglected and both water and sanitation receive less attention than education for development aid (WHO, UN Water 2010).

The links between education, health and sanitation are accepted, but the exact nature of causality remains unclear (Narayan & Prennushi 1999). The benefit of collaboration between these sectors to improve sanitation conditions, school learning environments and education results has already been recognised resulting in numerous School WASH programmes.

Yet, despite the plethora of international targets and goals, little progress has been made in meeting the needs of the most vulnerable (WHO, UNICEF 2010). The Millennium Development Goals, whilst providing the impetus for many worthwhile programmes and efforts, fails to mention disability or disabled people. Similarly the International Development Targets for Education defined in the Jomtien 1990 “Education for All” World Conference and the Dakar “World Education Forum” in 2000 failed to specifically identify children with disabilities as a target group.

The WASH sector has become increasingly aware of the gap in “coverage”, recognising that “gender mainstreaming” and “child friendly schools” have still left out groups of vulnerable people.

Attitudes to disability have changed radically in many parts of the world however significant numbers remain stigmatised, feared and discriminated against. The relationship between poverty and disability is not as well understood as common sense would suggest, but research shows that the majority of disabled people live in Low Income Countries (LICs). Therefore activities which address disabled people’s needs are likely to benefit the poor and vice versa. “Equity and inclusion” issues are being recognised by WASH agencies and inclusion of disability issues in development programmes is claimed by many donors.

Tanzania is a country which has embraced the principle of Universal Primary Education (UPE) and therefore the opportunity to maximise the attendance of disabled children presents itself. Mainstreaming accessibility into education is a stepping stone to mainstream physical accessibility in other institutional buildings and services. Therefore enabling children with either permanent or temporary disabilities has a critical role to play in the complex puzzle of poverty alleviation.

This study aims to investigate if any connection between accessible sanitation in facilitating inclusive education for disabled students can be identified, with particular interest in the current barriers to provision of effective accessible sanitation including the institutional environment and perceived costs.

1.2 Goal

Unlike collection of water, which can be done by others on behalf of a disabled person, only a disabled person themselves can urinate or defecate, even if assistance is provided. In addition, it seems likely that health risks of using inaccessible school sanitation are greater than health risks from use of inaccessible school water points.

Hence the goal of this research is to:

Understand the role of accessible sanitation in facilitating inclusive primary education in Tanzania

1.3 Objectives

In order to achieve the above goal, there are a number of objectives for this study:

1. Assess the benefits of both “accessibility features” and “good practice watsan” features of school sanitation for students with different impairments

- a) Define compliance criteria
- b) Record accessibility + watsan features
- c) Assess accessibility + watsan features against criteria
- d) Identify the extent that feature enables independent use by disabled children

Definitions:

- Accessibility features: those physical elements that aid accessibility, e.g. ramps
- Watsan features: those features which are good water or sanitation practice e.g washable slabs
- Disabled children: any child considered having a disability in the Tanzanian context e.g. albino
- Compliance criteria: objectively measurable criteria e.g. gradient
- Inclusive education – where all children learn together, as much as possible

2. Identify the significance of inaccessibility as a barrier to disabled children’s enrolment, attendance, attainment and completion in inclusive primary education.

3. Understand the institutional environment in relation to provision of accessible sanitation in primary schools

4. Estimate the construction costs of accessible sanitation in relation to school sanitation

1.4 Contribution to knowledge

The outcomes of this research will hopefully be of benefit to a variety of stakeholders, for varying reasons

1.4.1 Raising awareness of accessible School sanitation across the sectors

Existing information on accessible sanitation tends to be limited to the sanitation sector or disabled people’s organisations (DPOs) who are active in infrastructure provision. There is limited input from the education sector and even less from the construction sector.

It is hoped that this study, by taking on board the interests of all these parties, will create a document that is useful to all and facilitate cross-sectoral communication that is essential for accessible sanitation in mainstream schools to become the norm.

1.4.2 Design standards

By default, poverty reduction interventions target vulnerable groups which should include disabled people and many international donors claim to include accessibility in their development programmes. However often the specific needs of disabled people are often not catered for. The output of this research will provide specific examples of accessible school latrine features with guidance on compliance criteria to aid construction supervision and ensure effectiveness for disabled students.

1.4.3 Funding decisions

Accurate funding and budgeting is a necessary part of the planning process for international donors, governments and individual schools. Whether decision makers require justification for budget increases or whether they require data on which to base budget estimates, this research will hopefully contribute to future research on assessing the costs of accessible sanitation.

1.5 Scope of Study

1.5.1 Geography

This research focuses on the school sanitation situation in mainstream primary schools of Tanzania, principally government schools in the Dodoma and Dar es Salaam regions.

1.5.2 Water, Sanitation and Hygiene (WASH)

As outlined in 1.2 the fact that only a disabled child themselves can defecate was a determining factor in focusing on sanitation during this study.

1.5.3 Sanitation as a barrier to inclusive education

This study focuses on the physical barriers to inclusive education and accessible sanitation, but those societal, institutional or financial barriers perceived as more critical by both child and adult interviewees are also noted.

1.5.4 Scope of inclusivity

The terms “accessible”, “inclusive” and “vulnerable” can be applied to a variety of social groups but in this study refers to the disabled. In line with the concept of universal design, this study focuses on sanitation accessibility for disabled children as facilities which can be used by them are presumed to be accessible to other vulnerable children.

This report considers all children with some form of impairment which results in their exclusion from education or sanitation. In the specific context of Tanzania this includes albinos but not children with long term illnesses such as HIV/AIDs, which is justified in 2.2.4.1.

1.5.5 Inclusive education

This research is principally concerned with facilities in Tanzanian public primary schools as these are the focus of the United Republic of Tanzania’s (URT) UPE programmes. The final draft National Strategy on Inclusive Education (NSIE) acknowledges that, at this time, the focus of equitable access for disabled children is in basic rather than secondary education.

Some mainstream schools have been formally recognised as Inclusive Schools by the government.

1.6 Structure of study

Section 2 provides a review of the literature relevant to the topic based upon some core assumptions related to provision of poverty, education and sanitation and their inter-connectedness.

These are:

- sanitation and education are both a social and economic good
- poverty can be used as an indicator for disability in lieu of disability specific information
- attention to the most vulnerable and most marginalised automatically means that others benefit
- the economic arguments for any proposed development activity are always required, but in today’s economic climate they are even more important

Much has been written on these issues and detailed justification will not be reproduced here except

where specifically relevant to disability, inclusive infrastructure or inclusive education.

Where information is available, these issues in the Tanzanian context are also be outlined.

Section 3 explains the reasons for using both quantitative and qualitative data and the methodology used to collect and analyse the different data sets relating to physical accessibility and condition of sanitation facilities, attitudes and perceptions on disability and inclusive education from disabled children and adult informants

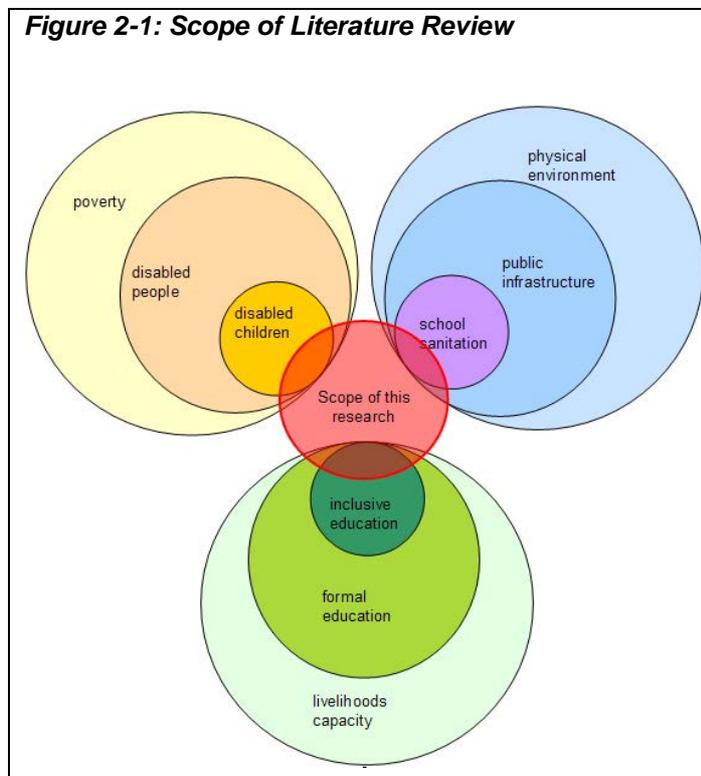
Section 4 presents the findings in relation to each of the research objectives and in Section 5 the discussion of the information found during the field research are presented.

In Section 6 the researcher's conclusions will be presented and recommendations on the basis of this study. A review on the success of this study in meeting it's objectives is given as well as suggestions on research methodology and ideas for further research.

2. Literature Review

2.1. Purpose and Sources

This literature review will identify and draw together a number of issues which combine and influence the effectiveness of accessible school sanitation in equalising access to education for children with disabilities. It will discuss the main issues of disability, poverty, education and



sanitation and identify their inter-relationships, particularly in respect of accessible sanitation for disabled primary school students (Fig 2.1).

It starts by explaining the various social constructs of disability and specifically the social model in relation to this study.

This section will review the development of “inclusive” sanitation approaches from the perspectives of Universal Design and Child Friendly Schools.

Primarily to inform the field research, it will investigate the prevalence of disability both internationally and nationally and specifically the level of enrolment in primary education for disabled children in Tanzania and any

proven or anecdotal linkages between poverty, education and sanitation. It will identify, compare and critique existing methods for assessing accessibility that have been used in previous studies in order to develop a methodology for the field research.

It will identify review the institutional environment to accessible infrastructure provision in education and previous attempts at cost analysis and estimation of the “extra” cost of accessible infrastructure and consider appropriateness of the approaches used in order to inform the method to be employed.

2.1.1. Sources of Information

A number of search strategies were employed to identify relevant literature.

2.1.1.1. Internet general

Electronic searches on the web were carried out using variations and combinations of the following search terms accounting for regional alternative spelling and vocabulary, use of word roots, acronyms etc:

- Watsan, WASH, SWASH, water, sanitation, latrine, toilet, drophole
- Disab+, differently-abled person (DAP), disabled person/ child, person/ child with disability (PWD/CWD), Children with Special Needs (CWSN)
- Literacy, education, school
- Education for All (EFA), Universal Primary Education (UPE), MDG 2, Inclusive/ Special Needs Education
- Universal /Inclusive design, access/accessible/accessibility, child friendly schools/ sanitation

2.1.1.2. Internet databases

Sites searched on the world wide web included Google Scholar and the Loughborough University Pilkington Library Catalogue. Some documents were sourced from document databases and some via Athens accessible sites including, but not limited to, Science Direct, Scopus, Elsevier and Wiley. More selective searches were undertaken on the websites of relevant agencies and speculative enquiry mails sent to contacts referenced on relevant webpages. These included:

- UN and international development agencies; WB, ADB, WHO, JMP, UN HABITAT, UNESCO, UN Water
- Various sites of Government of Tanzania (GoT) and United Republic of Tanzania (URT) ministries and departments; (www.tanzania.go.tz), including Ministry of Education and Vocational Training (MoEVT), Ministry of Health and social Welfare (MoHSW), National Bureau of Statistics (www.nbs.tz), National Construction Council (www.ncc.or.tz), Occupational Safety and Health Authority (OSHA)
- Sanitation development agencies; WSP, SuSanA, WaterAid, SNV
- Education and Child Rights agencies; UNICEF and Save the Children, EENET, HakiElimu, TENMET
- Disabled Persons agencies; Handicap International, Christian Blind Mission (CBM), Leonard Cheshire

2.1.1.3. Web based resource pages

A number of existing literature reviews and on-line bibliographies were referred to including:

- Source; web-based resource list managed by Handicap International which was originally based on a bibliography developed for DEW Point, the DFID Resource Centre for Environment, Water and Sanitation by WEDC
- UCL hosted Leonard Cheshire Disability & Inclusive Development Centre (LCD-IDG) publications
- WEDC Knowledge Base
- WASH Forum, IRC, FRESH (Focussing Resources on Effective School Health), SHARE (Sanitation and Hygiene Applied Research for Equity)

2.1.1.4. Convention al sources

The “snowball method” of identifying suitable documents was also employed, where references cited in relevant papers were followed up. Other documents were suggested by contacts in response to communication and queries from the researcher.

2.1.2. Statistical Data

In order to understand the current situation regarding national levels of disability, particularly amongst school aged children, reference was made to various statistical records compiled internationally and nationally by multi-lateral agencies, URT or GoT. Efforts to find data from a variety of sources to provide a degree of reliability were hampered by the variations in quality, level of detail and disaggregation of data as well as significant differences in when and how they were produced which limit analysis

2.1.2.1. School aged population

Obviously it is not correct to assume that the population within the official school age who are in

education are necessarily in Primary Education, and vice versa. In reality the actual Primary School age range is greater than the official school age range and data for registered students does not always distinguish between pre-primary, primary or non-formal education (NFE) enrolment. However, for the purpose of enabling comparison with the disability spread amongst children, this research assumes the primary school age range of 4-14 inclusive.

2.1.2.2. Measuring disability prevalence

The disabled population figure of 10% as estimated by the WHO in 1970's is often cited (Elwan 1999:5, WHO 1981:10) despite the fact that how disability is defined and how disability data is gathered has been refined (WHO 1981:8, WHO 2011:22) and there have been significant changes to global populations and demographics.

In the 1981 International Year of Disabled Persons, data from 55 countries were analysed by the UN who estimated that the percentage of disabled persons ranged from less than 1% up to 21%. However the UN noted that variations in national definitions of disability, aggregation ranges and data collection methods meant that the figures could not be used for comparison.

The latest World Report on Disability of 2011 states that an international prevalence level of 15% is more likely for the over 18 population (WHO 2011:27,261) although qualifications of this figure are provided, and a range of 0.4 to 12.7% for children between 0 and 14 years is estimated in low and middle income countries (WHO 2011:36).

2.1.2.3. Insufficient and inadequate disability data

Although the UN has developed and revised guidelines for the compilation of disability statistics (UNSTATS 2001) and the Washington Group questions are now widely used in surveys of disability (WHO 2011:26, URT NBS 2008:3), many variations still exist between national definitions of disability as well as the consistency of data collection methods.

The lack of data does not allow correlations to poverty, cause or impacts to be analysed. Elwan noted that *"although differences in concept and definition contribute to the variability of the prevalence estimates, the underlying problem is lack of information"* (Elwan 1999:2). The lack of data as a barrier to development is cited by many sources (Polat 2011:52), with the 2010 Education For All – Global Monitoring Report (EFA-GMR) identifying development of *"data collection systems with a focus on disaggregated statistics to identify marginalised groups and monitor their progress"* as a recommendation for overcoming marginalisation. (UNESCO 2010:272).

The 2011 World Report on Disability also highlights difficulties in comparison and accuracy of estimates (WHO 2011:25-32) as well as identifying some of the difficulties in estimating prevalence of child disability (WHO 2011:36).

Specifically there is little data on disabled children and disabled children's attendance and attainment in school (Collender et al 2011:4)

2.1.3. Limitations due to lack of data

2.1.3.1. For planning

The 2010 EFA-GMR recognises that data is needed to be able to inform policy, target resources as well as for effective monitoring. The report states that *"national statistical surveys fail to adequately capture the circumstances and conditions of those being left behind, reinforcing their marginalisation"* (UNESCO 2010:272).

With no indication which interventions have a beneficial impact, or which are most cost effective it is not possible to target activities or justify investment (Save the Children UK 2008:15). Absence of policies and the resulting lack of targets, at both international and national level, mean that the numbers of children yet to be reached and the scale of the need are unaccounted for in planning interventions (UNESCO 2010:8).

2.1.3.2. Prevents monitoring and evaluation

The lack of data means that it is not possible to report on progress or impacts (Kabendera 2009). Chosen indicators often fail to be representative of the intended outcomes and this is an area for improvement noted in URT's 2010 MKUKUTA Annual Implementation Report (MAIR) (GoT, Ministry of Finance and Economic Affairs 2010:120). The lack of measurable criteria is an obstacle in the achievement of poverty reduction goals and discussed in further detail in Section 2.7.2

2.1.4. Information Gaps

2.1.4.1. Costs information

The need to justify costs and the demand for transparent accounting is an unavoidable part of project development. The lack of data on the cost of accessible infrastructure means that there is a vacuum for any discussion.

The inconsistent approach and scope of accessible infrastructure construction cost data, and in the methods used to assess cost means that further research is still required to provide a clearer understanding of inclusive sanitation costs.

2.1.4.2. International and National Legislation and Regulations

The information gaps on this topic stem from the fact that a number of draft documents and legislation are currently under discussion and are not available in the public domain. In addition, from such documents it is only possible to assess the theoretical institutional environment as detailed review of government implementation plans and programme documents was not considered pertinent to the main purpose of this study.

2.2. Disability

There are a number of conceptual models of disability. A brief explanation of the main models is provided in this section to understand the context in which this study is set. In addition it will attempt to estimate the likely number of disabled students that would need to be catered for and the range of their disabilities.

2.2.1. Models and definitions

Over the course of time, society's attitudes towards disability has changed significantly and today the "definition" of disability and even the words used to describe "disability" are wide ranging and have varying connotations.

2.2.1.1. Charity model

The historical "Charity" model (pre 1950's) was used until after the second World War. Implemented by "able" people for "disabled" people it was a philanthropic approach which provided support to the "less fortunate" to suit the whims and resources of the "fortunate". The unsurprising failure of philanthropists to adequately address the needs of disabled people perpetuated their poor living conditions and reliance on outsiders, further supporting the perception that disabled people do not have the ability to contribute equally to society (Edmonds 2005:11).

2.2.1.2. Medical model

The “Medical” model emerged in the 1950’s following significant developments in healthcare as well as social attitudes as a result of World War II. The need for wounded ex-combatants to reintegrate into society resulted in advances in rehabilitation, physiotherapy and orthotics techniques. This however, created the attitude that impairments or disabilities were conditions to be treated as an illness.

Therefore, where the disability was beyond the scope of treatment technology, disabled people were separated from the community and kept “*with their own kind*”. This approach also failed to enable disabled people to play active and productive roles in their community and transferred their dependency to medical practitioners. (Edmonds 2005:11).

2.2.1.3. Social model

The “Social” model emerged in the 1970s, led by disabled people and Disabled People’s Organisations (DPOs) to overcome the barriers that the medical model of disability created and demand equal rights for disabled people. The social model identifies the barriers in society which prevent disabled people from having equal opportunities in their communities. To overcome the societal, institutional, environmental or physical barriers requires society to make changes about how it thinks and operates. (Edmonds 2005:12).

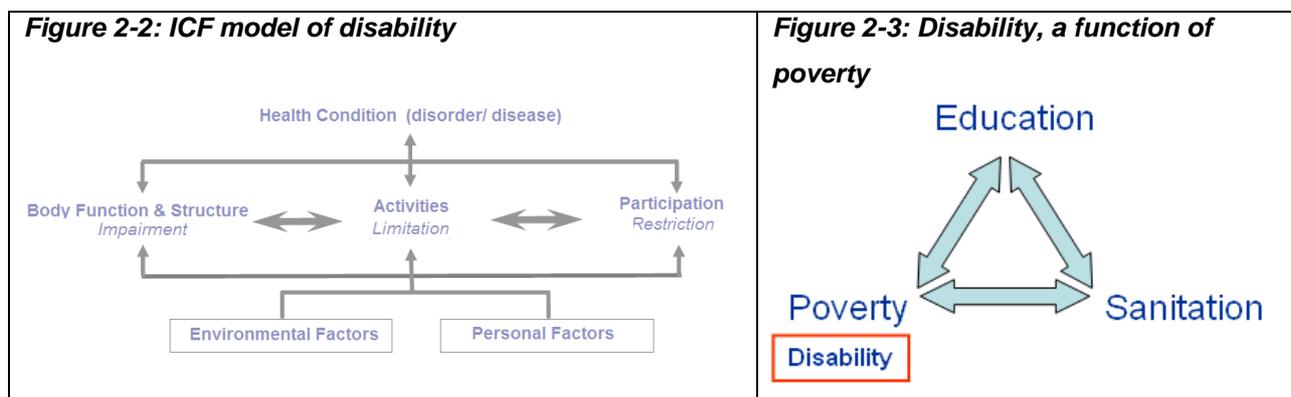
This construct aligns with the philosophy espoused by economist Amartya Sen (Sen 1999:90, Mont 2010) that wider society has a role to play in enabling access, not just to disabled people, but to poor, vulnerable and marginalised groups in any society. Similar social justice philosophies have been applied to inclusive education approaches with emphasis on providing equity in education (Polat 2011:51).

Criticisms of the social model

The Social model has its critics amongst professionals in the field who argue that the distinction between “impairment”; an attribute of the individual body or mind; and “disability”; a relationship between a person with impairment and society; is not as well defined as the Social Model purports. In reality “*where does impairment end and disability start?*” Some impairment/disability distinctions are straightforward, such as when a wheelchair user tries to enter a building where there are only steps. The critics suggest that the “*barrier free environment*” is an “*unsustainable myth*” (Shakespeare, Watson 2002:17-19). They argue that removing environmental obstacles for one person may introduce obstacles for another. It is therefore impossible to remove all the obstacles for all disabled people.

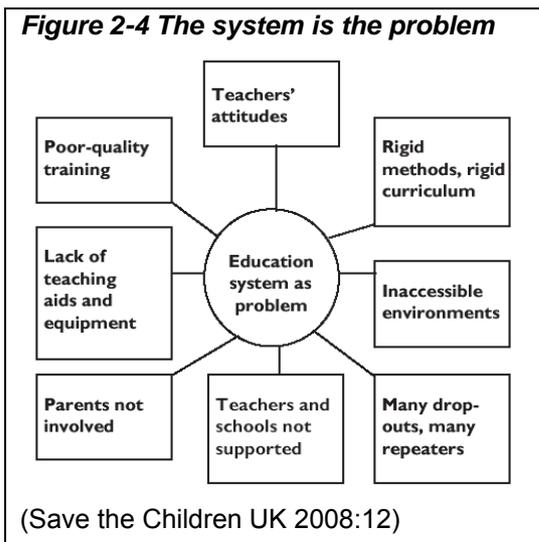
The WHO International Classification of Functioning, Disability and Health (ICF) (World Bank 2007:5) defines disability as the outcome of the interaction between a person’s health condition and the context in which the person lives (Fig 2.2). It assesses the activity and participation restrictions that arise from non-inclusive environment

In line with the construct of the social model, and due to the poor availability of data on disability, information relating to poverty has been assumed to be representative of disability throughout this literature review (Fig 2.3).



2.2.1.4. Social model implications on inclusive education

In parallel with changing attitudes towards disability there have been shifts in attitude to education for disabled children (Save the Children UK 2008:9, DFID 2004:20, Shakespeare & Watson 2002). From initial policies of segregated or Special Education, the Western world has since moved to Integrated or Inclusive education. With regard to the barriers to education, equivalent attitudes and views exist, i.e. “the child is the problem” (medical) versus “the education system is the problem” (social) (Save the Children UK 2008:12; Handicap International & CBM 2006:72).



These arguments apply not just to disabled children, but children in general who find themselves excluded or unable to participate in the education system (Fig.2.4)

“There is no such thing as ‘the normal child’; instead, there are children with varying capabilities and varying impediments, all of whom need individualised attention” (Nussbaum in Polat 2011:52)

Yet mainstream school infrastructure cannot afford to focus on individual children, but instead needs to provide an environment which is accessible to the majority. This idea is discussed further in 2.2.2.

2.2.1.5. Social model implications on sanitation

In order for sanitation to be successful, all human waste needs to be safely separated from people (Cairncross & Feachem 1993). Both individual household and institutional sanitation must achieve this goal and the whole basis of Community Led Total Sanitation is the premise that if even one member of a community practices open defecation, then the entire community remains at risk. Therefore it is essential to ensure that the various barriers to sanitation for disabled people are overcome to achieve the intended sanitation outcomes for all.

2.2.2. The concept of Universal or Inclusive Design

Having identified one of the barriers to disabled people as being the environment, the natural progression to enable them to participate in their communities is to make their environment as accessible as possible. In a disabled person’s home accessibility features can be tailor-made to suit individual preferences and adjusted over time to meet changing needs. In public and communal spaces, where any number of disabled people with a range of disabilities may require access, this individualistic approach is not appropriate.

Universal or Inclusive Design aims to make any building or facility accessible to as broad a range of

disabled people as possible. As noted in Section 2.2.3, aspiring to a fully barrier free environment is not realistic and in fact many able bodied people face varying degrees of inaccessibility due to the inherent differences between individual physiology as well as cultural and religious beliefs (Polat 2011:51).

The Universal Design approach is therefore applicable to the school sanitation situation.

2.2.3. International Disability Prevalence

The purpose of this section is to attempt to estimate the number of disabled children who have the potential to enter inclusive education, and the range of their disabilities such that appropriate technical standards can be developed.

2.2.3.1. International child disability prevalence

The disability prevalence for the general population was addressed in 2.1.2.2. The estimated number of disabled children in education also varies widely with estimates between 1 and 33% (UN Enable n.d., Polat 2011:52), versus absolute estimates of disabled children out of school ranging from 25 to 100 million (Save the Children UK 2008:15). It is clear that the varying definitions of disability and “education” make it almost impossible to use the data to improve current policies and practices.

2.2.3.2. Disability in Low Income Countries

UN Enable’s website suggests that 80% (UN Enable n.d., Polat 2011:52) of the world’s disabled population live in Low Income Countries (LICs). The World Bank (WB) suggested in 1999 that “*disabled people are estimated to make up 15 to 20 per cent of the poor in developing countries*”. This is not surprisingly higher than in “developed” countries due to the associations of disability with poverty and limited access to education, sanitation and healthcare (Elwan 1999:2,15). This has been reinforced by the data published in the latest World Report on Disability that in particular countries “*children from poorer households ...are at significantly higher risk of disability than other children*” (WHO 2011:262).

Although the measurement of “poverty” in these cases is based on the economic concept of poverty, it is now more widely accepted that “capability poverty” equally, if not more so, is related to prevalence of disability as noted in Section 2.2.1.3

2.2.4. Disability in Tanzania

2.2.4.1. Tanzanian attitudes to disability

Not unsurprisingly, the social and cultural definitions of disability in Tanzania vary from those used elsewhere (Polat 2011:51). Attitudes to disability tend to be in line with the Charitable Model and hence there is a general reluctance to be classified as disabled (Shakespeare & Watson 2002:21, Chuwa:10-11).

The Tanzania National Policy on Disability (NPD) (URT MoLYS 2004) has its basis in the ICF model and therefore the official definition of disability does not identify albinos as a disability group (CCBRT 2010).

However Tanzanian DPOs include albinism as a disability although whether albinos experience any specific challenges relating to sanitation facilities was not found in any of the literature. TENMET (Tanzania Education Network) report on their website that “*shame, peer abuse and stigma*” of disabled people are prevalent in Tanzanian society (TENMET 2009), all barriers to advocating for inclusive education and accessible infrastructure.

2.2.4.2. Tanzanian disability data by source

A very early study of disabled children in education only researched visual, hearing and “mentally” impaired students (Possi 1996:161) and the lack of data on disabled children in Tanzania was noted in a 2005 Commonwealth Education Fund Assessment of the Tanga Region (Tanga Coalition 2005:19)

2002 Census

The 2002 Tanzania Census questions were limited to asking respondents to identify if they had a disability and if so, what the nature of the disability was, e.g. physical handicap, visually impaired, albino, and estimated disability prevalence at 2%. However, National Bureau of Statistics (NBS) recognised that the framing of the census questions meant that many people with disability were likely to have been missed from the census, e.g. the elderly or chronically sick who do not perceive themselves as “disabled” (Shakespeare & Watson 2002:21, Chuwa:10-11).

The census estimated disability prevalence at 7.8% for the population above 7 years of age, with disability more common in rural areas (Chuwa:14-17).

Household Budget Survey 2007

As with the census, a national Household Budget Survey (HBS) is undertaken regularly in Tanzania. The 2007 survey does not include any data on disability.

2008 National Disability Survey

The latest source of disability data is the National Disability Survey (NDS) of 2008 undertaken with the support of UNICEF, UNFPA and UN country office is assumed to be statistically robust but does not cover the entire population (URT NBS 2008).

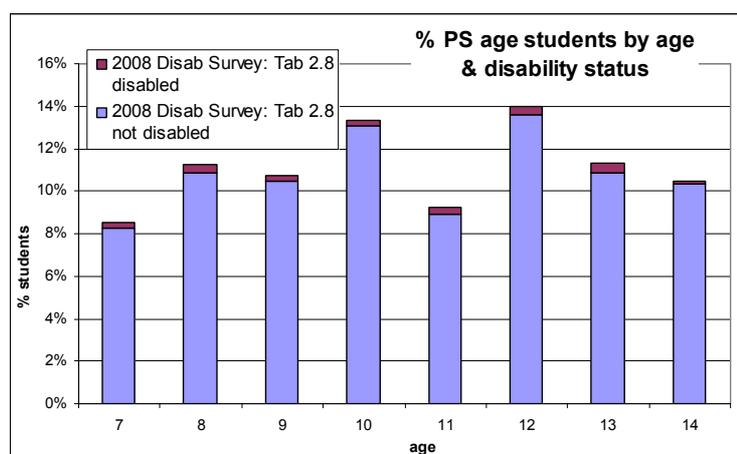
Acknowledging the shortfalls of the 2002 Census question the first NDS was undertaken in 2008 using the Washington Group questions to measure disability (2.1.2.3). It identified the number of students surveyed who were disabled (Fig 2.5) and their disability type.

However the categories of disability used are not consistent with other data sources, including the 2002 Census, limiting analysis (Handicap International & Save the Children UK 2008:38).

Data for some disability categories are not presented in certain tables, similarly data for particular age ranges are absent. The reasons for this are unclear.

This reflects inconsistent attitudes to albinism in particular, the problems of identifying disability in young children and the fact that households hide disabled family members (TENMET 2009).

Figure 2-5: Primary School students by age and disability



2.2.5. Conflicting and incomplete information on disabled primary school students

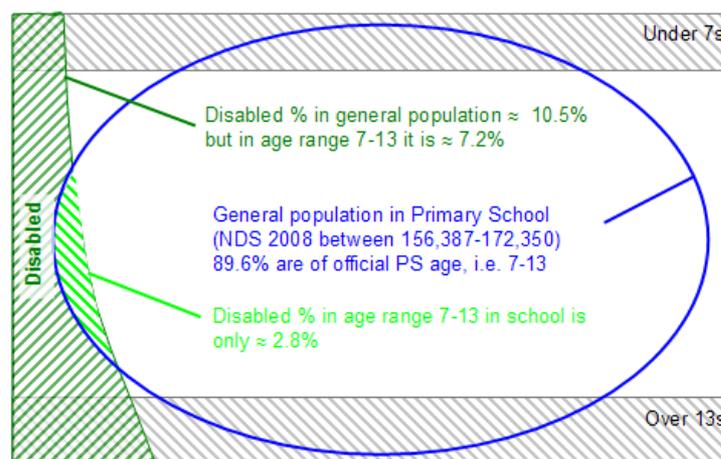
The NDS data for the official primary school age range is limited and not sufficiently disaggregated to enable analysis of disability prevalence or type amongst primary school aged children or actual school going children. Some tables cover the age range 4-22, but the data in other parts of the

survey start from age 5.

It provides inconsistent estimates of the number of disabled children of primary school age that are actually in school (Fig 2.6). The survey data also indicates that the percentage disabled children in school is much lower (2.8%) than percentage of disabled children in the general population aged 7-13 (7.2%) which is to be expected.

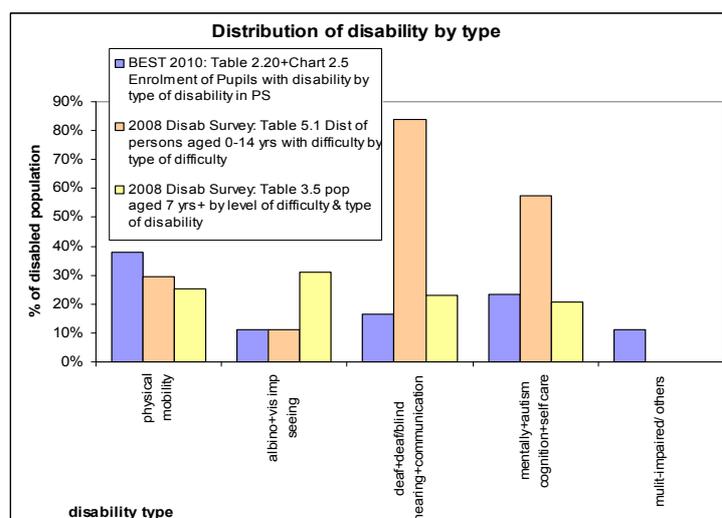
Basic Education Statistics Tanzania (BEST) are compiled annually and report the number of disabled students enrolled and the spread of their disabilities. However the disability categories used in BEST do not correlate with those in the NDS and there are again overlaps in categories. Although BEST data is supposedly based on actual enrolment information a note on Chart 2.20 states that “population data on density is not.

Figure 2-6: Data uncertainties



available, but the proportion of PS enrolment with disabilities is 0.35%” (URT MoEVT 2010:33). The source of this figure is not stated

Figure 2-7: Primary school aged students by disability



There is no disaggregation of disability type for those with multiple disability which all adds to the general lack of clarity when analysing the data from these two main sources. (Fig 2.7).

The data limitations have led to conflicting interpretation. HakiElimu, a national education NGO, reported that as of 2007 the number of disabled children enrolled in education was less than 1% (HakiElimu 2008:7).

The 2010 MAIR (GoT, Ministry of Finance and Economic Affairs 2010) failed to report any figure for the National Strategy for Growth and Reduction of Poverty (MKUKUTA) 2010 target of 20% disabled children to be enrolled in school.

Therefore it is not a simple matter to assess the number of disabled children who need to be brought into education or prioritise accessibility features for particular disabilities.

2.2.6. Lack of data for planning and monitoring

The lack of data for planning inclusive education has been identified within the MKUKUTA Disability Network for some time but they were unsuccessful in influencing the Monitoring Master Plan (NIDS et al 2011, Fritz et al. 2009).

2.2.7. Disability friendly infrastructure

A number of donors include disability issues in their strategies and policies but it is not clear how this

is being incorporated into programmes they fund (World Bank 2007:10). AusAid, Irish Aid and DFID have strategies for inclusion of disability in its poverty reduction agenda (DFID 2004:4, Mwendwa et al 2009, Snider & Takeda 2008).

There are few technical guidelines or standards from these agencies on providing accessibility.

2.3. Poverty and Disability

This section briefly discusses the relationship between poverty and disability (Fig 2.8) which is well accepted, but the cause and the effect have not been clearly isolated (Elwan 1999:1, Mont 2010, Mwendwa et al 2009).

Poor people are more likely to suffer from illness due to lack of education, nutrition or access to healthcare, and thus are more likely to be born with a disability or acquire one during the course of their lives. Conversely, the disabled, being prevented from accessing health or education services, are more likely to be poor (Fritz et al. 2009) (Fig 2.9)

2.3.1.1. World Report on Disability 2011

The Report identifies that children in poverty have higher risk of having a disability whilst households containing a person with disability “have higher rates of poverty than households without disabled members” (WHO 2011:263) and “tend to have lower school attendance rates” (WHO 2011:39).

2.3.2. National Poverty

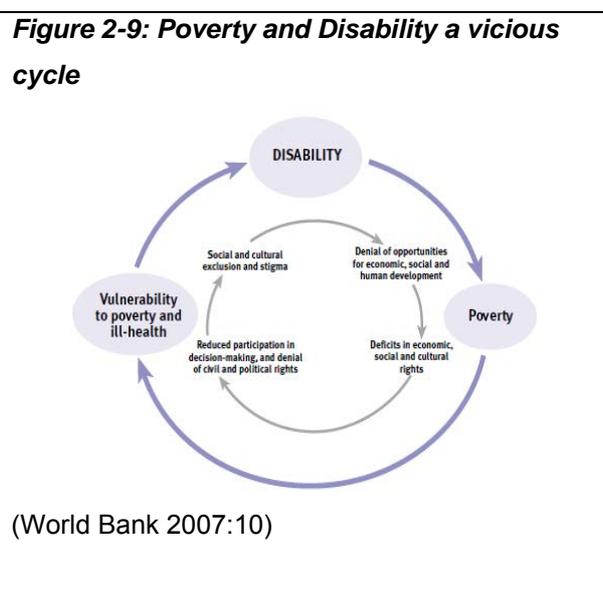
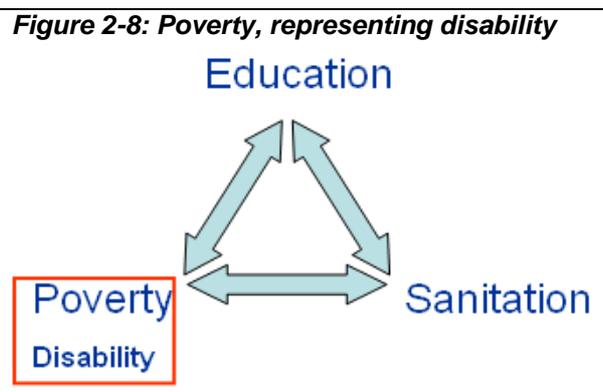
2.3.2.1. Competing for national funding?

There is a need to address disability throughout poverty reduction strategy papers (PRSPs). A Handicap International/ CBM report identifies Tanzania as one of the first countries to use the PRSP approach but the failure to address disability in its 2000 strategy. Yet to reduce poverty school enrolment and attendance alone is not sufficient and quality education is essential. In the context of this research educational quality is one of the many competitors for funding disability issues.

2.3.2.2. Quantity and Quality education require funding

The tensions between EFA and quality are apparent in every country, and all the more critical in developing countries where resources are at a premium (DFID 2001). The issue of education quality affects all students but the quality of education has a greater impact on disabled students who require quality teachers and infrastructure to achieve equal standards of education to their non-disabled peers (Montgomery & Elimelech 2007).

Tanzania is a country which has embraced the principle of universal primary school education, and therefore the opportunity to maximise the attendance of disabled children presents itself (UNESCO 2010:5). However, for over a decade the Tanzanian media have identified numerous challenges in addition to quality which prevent accessibility issues from being addressed in the education sector



(Kabendera 2009, Navuri 2010, Guardian Reporter 2011).

2.3.2.3. Funding Education

It is often assumed that LICs are less able to increase basic education, but the 2010 EFA-GMR shows that this is not necessarily the case, and Tanzania is a case in point (UNESCO 2010:5,50,56). Tanzania allocated approximately 19.4% of the national budget to education in 2008/9 and 18.5% in 2009/10 (GoT, Ministry of Finance and Economic Affairs 2010:106) however TENMET stated that previous UPE programmes had collapsed due to lack of resources (Navuri 2010). Even though the Primary Education Development Programme (PEDP) was introduced in 2000, as of 2009 standard school infrastructure still failed to provide access to the physically disabled (Philemon 2009). The 2000 Dakar Framework for Action identified the issue of financing education and that developing countries had pledged to enhance contributions to basic education. Yet ten years later “*finance remains a major barrier to Education for All*” (UNESCO 2010:119). Therefore it is not unsurprising that where education budgets face constraints the priority given to school sanitation and specifically to accessible sanitation is lacking.

2.3.2.4. Insufficient interest in sanitation

WHO/ UN Water record that water and sanitation continue to attract less support from both donors and governments than education (WHO & UN Water 2010:13,14,19). In addition the 2010 JMP progress report identifies socio economic discrepancies in sanitation access and unequal focus on water by donors (WHO & UN Water 2010:28, 30).

A Oxfam/ GTZ study on addressing disability in infrastructure includes water and sanitation as one of the three sectors researched but notes the lack of donor funding for disability related components (Oxfam GB et al. 2009)

In Tanzania a recent WSSCC study also stated that “*there is a serious problem of data availability for sanitation. It is next to impossible...to analyse the budget allocated and amount spent over the past 5 years*” (Chaggu 2009:20).

International focus on water is also reflected in a 2002 National report on Water and Sanitation in Tanzania conducted by URT which dedicates 15 pages to the chapter on water and only 2 pages to sanitation. The lack of interest is borne out in the 6 recommendations for water and 1 for sanitation (URT MoWLD et al. 2002:48).

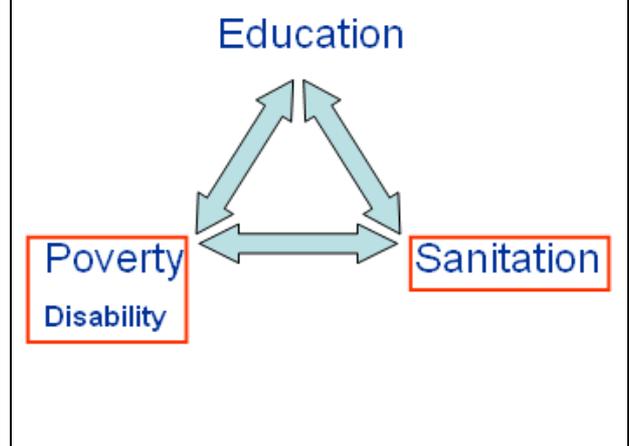
Figures for planned budget in Tanzania have been biased towards water supply with planned sanitation spending at less than 0.1% of GDP; primarily spent on conventional sewage schemes (Chaggu 2009:21); whilst water attracted about 1% of GDP (WHO & UN Water 2010:16). WSSCC identified that “*financing for sanitation ..is currently in a confused state due to the fragmented aspects in a number of ministries*”(Chaggu 2009:18).

Furthermore, failure to plan for the whole life costs of sanitation, which are instead viewed as “one-time” investments mean that the conditions and functionality of latrines are often poor (Chaggu 2009:26).

2.4. Poverty and Sanitation

It is not felt necessary to justify in detail the need for sanitation for the poor since the links to improved health and therefore learning or opportunities for income generation are well documented (Cairncross. & Feachem 1993, UN Water 2008). As stated at the beginning of this section, since the literature on disability is quite limited, the relationship between poverty and sanitation is taken to be representative of the relationship between disability and sanitation.

Figure 2-10: Poverty and Sanitation



2.4.1. Economic and health benefits

Accessible sanitation has the potential to reduce opportunity costs as well as preventing health care costs due to illness (Bailey & Groce 2010:15) in addition to enabling individuals to contribute to the national economy (Mwendwa et al 2009:665, WSSCC & WHO 2005:7).

2.4.2. Sanitation for the most vulnerable

There is little information of the impact of sanitation on disabled people but one can assume that “people with disability are at least at equal risk of exposure to any and all ...infectious diseases...but far less likely ..to have access to medical care” (Bailey & Groce 2010:11,15)

Data on “access of persons with disabilities to water and sanitation are largely anecdotal or based on small scale studies that are largely qualitative in nature” and focus on engineering solutions to infrastructure accessibility (Bailey & Groce 2010:16). The difficulties in gathering data on such a sensitive subject were recognised in a Handicap International study in Mali (Horne & Debeaudrap 2007:19)

However the fundamental reasons for demanding fully inclusive sanitation interventions were succinctly outlined during a SHARE workshop in March 2011.

- Human rights perspective - everyone has a right to clean and dignified sanitation
- Unless the sanitation needs of vulnerable and marginalised groups are met, health risks to the rest of the community remain
- Sanitation interventions only seem to work when they include “everyone in the community, the aged, young children, people with special needs...at work, play and home”
- Unless we consider the needs of the marginalised, the MDGs cannot be met.

Similar statements about the criticality of inclusive sanitation are made in briefing notes by other agencies (Collender et al 2011:5, DANIDA n.d.)

2.4.3. Tanzanian Sanitation and Hygiene Policy

The 2010 draft National Sanitation and Hygiene Policy aims to address a number of challenges in the sector (URT MoHSW 2011) identified in a 2009 WSSCC Situation and Gap Analysis (Chaggu 2009).

These challenges include a lack of national definition on sanitation as well as distribution of sanitation responsibilities throughout various ministries without formal coordination (Chaggu 2009: iv).

2.4.4. Disability friendly sanitation

The main sources of information are WEDC and WaterAid and a handful of disability organisations including Handicap International (Handicap International 2011, Jones 2011, WaterAid Madagascar 2010). They cover both advocacy materials (CBM n.d), more specific research on how disabled people use water and sanitation facilities (Horne & Debeaudrap 2007), or technical guidance for construction (David 2008), including in emergencies (Handicap International 2009).

WaterAid documents from various country programmes include Bangladesh (DSK 2008), Madagascar (WaterAid Madagascar 2010), Nepal (WaterAid Nepal n.d) and Ethiopia (Tesfu & Magrath 2006). Although some of these documents consider disability for communal sanitation facilities, only one covers school situations.

Limited literature was found from country sanitation or disability organisations, either studies for advocacy purposes or technical guidelines (Shrestha 2006; UNAPD, Ministry of Gender, Labour and Social Development 2010)

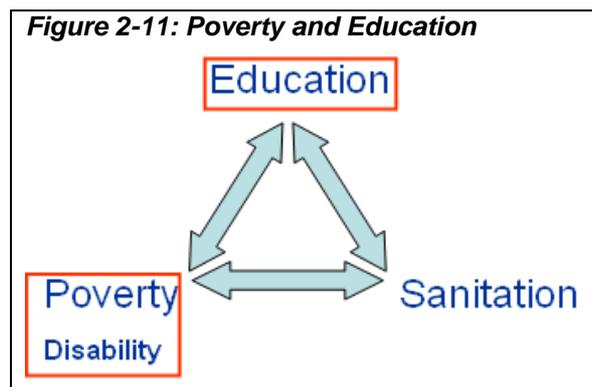
Documents from donor development agencies mainly addressed inclusion of disability into policy and programme design, but few identified accessibility as mandatory in projects that they funded (DANIDA n.d., Wiman & Sandhu 2004)

The most voluminous and widely cited source of information on accessible sanitation is from WEDC (Jones & Reed 2005) and referred to by Handicap International (2009), UNAPD, Ministry of Gender, Labour and Social Development (2010) and Dzikus (2008) amongst others. This DFID supported research is extensive and detailed, providing both advocacy and technical guidance material for sanitation in a development context. However it does not consider the particular needs of schools although it identifies the need to use universal design approaches in households to enable continued use by non-disabled members. It also appears to be the most widely disseminated material with workshops held in Uganda, Cambodia, India and Bangladesh (Jones & Reed 2005)

A number of MSc theses have been written on the subject investigating the current use of aids and accessible designs for people in Mali (Russell 2007), Bangladesh (Fawzi & Jones 2011), Malawi (Chambers 2005) and Ethiopia (Neba 2010). A study on disabled access to water supply in Tanzania was conducted in 2006 with the support of Water Aid (Holding 2007). Only two of these studies addressed technical accessibility standards.

2.5. Poverty and Education

As for Section 2.4, this literature review will not provided extensive detail of the relationship between education and improved health and economic capacity since it is well documented internationally and nationally (Guardian Reporter 2011). This relationship is the basis of poverty reduction interventions that focus on improving education access and quality (Fig 2.-11)



The lack of robust and consistent data relating to school enrolment, attendance and attainment is

cited by many as a significant obstacle in assessing the impact of interventions on education (UNESCO 2010:2,6).

The reasons for such poor data include the fact that official age ranges often do not reflect school going children's actual ages (2.1.2.1), enrolment and attendance data may be adjusted for political or financial reasons or may just be poorly recorded. The fact that as of the 2010 EFA-GMR this issue of data is still being raised suggests that little improvement has been made since 2000 (UNESCO 2010:58).

2.5.1. Link between lack of education and poverty

Research has yet to clarify causality of the relationship between poverty and education, i.e. whether poor education results in poverty, or poverty results in poor education (Narayan & Prenzushi 1999).

2.5.1.1. World Report on Disability 2011

"Children with disabilities are less likely to start school than their peers without disabilities. They also have lower rates of staying in school and of being promoted" stated the report (WHO 2011:263).

There is no mention of sanitation being a specific barrier to education.

2.5.1.2. "Educating out of Poverty" 2007

Although slightly dated, the DFID "Educating out of Poverty" report noted that sanitation must be included as a fundamental part of any school development (Palmer et al. 2007:64) but fails to mention either child friendly or accessible infrastructure planning.

2.5.2. International Development Goals for Education

2.5.2.1. Donor focus on primary education

The development sector accepts that although education throughout the life of a child and gender equity in access to education is a universal right, due to the scale of the challenge, achieving UPE is the first step. However, as highlighted in 1.1, the needs of disabled people are not mentioned anywhere in the MDGs (WHO 2011:12, Fritz et al. 2009, UN 2010:62). Failure to specifically include disability in the objectives of MDG2 hampers both the achievement of UPE as well as excluding disabled children from education. This limits the potential benefits of inclusive school facilities for other students (UNESCO 2010:8).

Increasing focus on disabled children

The 1990 World Conference on Education For All (EFA) held in Jomtien, Thailand made UPE as a target for 2000 (Muller n.d.) and at the 1994 UFA Conference, the Salamanca Statement and Framework for Action on Special Needs Education was finalised. The EFA Mid-Decade Meeting, 1996 in Amman, Jordan, noted the fact that *"despite the progress in expanding primary education during the 1990s the 'all' dimension of the Jomtien vision of Education for All still needs more attention"* (UNESCO 1996:36).

Yet the document makes no mention of the needs of children with disabilities and further expansion of the scope following the 2000 Dakar World Forum to include *"girls and children in difficult circumstances"* still did not specifically identify disabled children (Muller n.d.). The 2010 EFA-GMR was the first global report to highlight education for the disabled (UNESCO 2010).

The 2010 MDG report also highlighted disability noting *"the link between disability and marginalisation in education"* (WHO 2011:12) and specifically that in Tanzania *"being disabled doubles the probability that a child will never attend school"* (UN 2010:18).

2.5.2.2. Failure to translate into reality

The use of the MDGs by developing countries to frame their poverty reduction interventions mean that disability issues have been omitted from many strategy documents (Groce & Trani 2009). A 2010 report on DFID's education activities found that "*despite international consensus that all children with disabilities are entitled to the same rights as non-disabled children, there seems to be a gap between policy and practice*" (Modern et al 2010).

2.6. Inclusive Primary Education

As noted in 2.5.2.1 the international principles of inclusive education were specifically agreed in the 1994 Salamanca Statement, yet the scope of "inclusive education" is still not understood to mean the same thing in many countries, with varying interpretations of Education for All, Inclusive or Special Needs education (Save the Children UK 2008:9).

Inclusive Primary Education is seen by many to be beneficial to large numbers of children who cannot access special education due to physical and financial barriers. In many countries governments see inclusive education as a cheaper alternative to special education. A 1993 WB study claimed that the "*vast majority of children with special educational needs can be cost-effectively accommodated in regular primary schools.*" (Metts 2000:27-28). This statement is based on the whole range of education activities, not specifically infrastructure or sanitation.

In most LICs the absence of significant discussion on the topic infers that the education of disabled children via inclusive education is assumed as the cheapest and therefore default policy in the absence of any alternative views.

2.6.1. Funding inclusive education

Over and above funding required to bring mainstream education up to quality standards, inclusive education has its own associated costs.

The 2010 EFA-GMR states that the cost of reaching marginalised children has been consistently underestimated since more effort is required to reach vulnerable children and more effort required to keep them in school. The EFA's view is that continuous underbudgeting has been partly to blame for any real progress since the 2000 Dakar Framework objectives were set (UNESCO 2010) but throughout the document also recognises that national budgets for education are under pressure due to global economic pressures.

The claim that inclusive education is cheaper than the alternative, special education, and that huge budget increases are not required is undermined by conflicting information on funding requirements makes it easier for politicians to continue to do nothing (Save the Children UK 2008:52,56).

The cost of providing physically accessible facilities should be the easiest "accessibility" activity to quantify, yet little data on the costs of accessible school sanitation in development contexts exists. One of the most widely cited estimates originates from a report by Metts for the World Bank (Metts 2000; World Bank 2007:21; Snider & Takeda 2008:6; Steinfeld 2005). However the data on which it is based is not specific to sanitation or comparable to most LIC, education or sanitation contexts. The validity of this figure will be discussed further in 2.11.

In addition to infrastructure investment there are many other areas where funding would be required to achieve inclusive education, including teacher training, teaching materials, convincing parents to value education, awareness raising about education of disabled children, policy review and

enforcement. Save The Children state that “*attitudinal barriers to inclusion are arguably greater than barriers posed by material resources*” and the cost of overcoming such barriers is much more difficult to assess (Save the Children UK 2008:15,50).

Recent UNESCO research came to similar conclusions, where participants from around the world noted that policy and legislation related to inclusive education is rarely implemented (Polat 2011: 56). This view is also borne out by the fact that in many developing countries, inclusive education initiatives are being led by non-governmental agencies, with governments promising to build on any successful initiatives (Polat 2011:57, Save the Children UK 2008:16).

2.6.2. Inclusive Primary Education in Tanzania

Recognising that education is key to national health and economic development, the legal right being enshrined in the Constitution, URT has made great efforts in implementing UPE through PEDP I and II. Despite initial focus on enhancing special education capacity, Tanzania has now shifted to prioritising inclusive education in line with donor thinking and in 2011 a draft Inclusive Education Strategy was released (Possi 1996, HakiElimu 2008, URT MoEVT 2011).

Yet a study of 139 primary schools in Tanga region facilitated by a coalition of Education and Disability NGOS recorded that there was “*great dissatisfaction from interviewees with how the PEDP is dealing with children with disabilities*” (Tanga Coalition 2005)

2.6.2.1. 2011 National Strategy on Inclusive Education

The 2011 draft National Strategy on Inclusive Education (NSIE) recognises the “*tension between quantity and quality*” but also that all children should have equitable access to education, noting the need for affirmative action to be included in legislation and policies (URT MoEVT 2011:2,3). It recognises that physical and environmental barriers exist for all students, including inaccessible buildings (URT MoEVT 2011:16) and Strategy 1.3 identifies the need to “*review and redesign resourcing and financing for inclusion*” such as improving the physical environment including latrines (URT MoEVT 2011:23). However at this time no specific targets or indicators have been identified. The NSIE says that fund allocation to schools would be based on the “*characteristics of the learner population*”. It is unclear whether this means that facilities will only be provided if disabled children are already attending a particular school (URT MoEVT 2011:27).

In addition the identified activities for Strategy 1.3 state that funds would provide “*incentives for barrier-free schools*” which again suggests that providing physical accessibility would be an optional rather than compulsory activity (URT MoEVT 2011:28).

2.6.2.2. Draft Sanitation and Hygiene Policy omits accessible school sanitation

Although 2.6.2.1 confirmed the education sector’s recognition for accessible school sanitation, there is no mention at all of the need for accessible sanitation for disabled children in the Draft Sanitation and Hygiene Policy of January 2011 (URT MoHSW 2011:13-18) although its parent agency, the Ministry for Health and Social Welfare, is responsible for coordinating all disability issues (URT MoLYS 2004).

The need for better communication between the sanitation and hygiene sectors is identified in a 2004 GTZ report which stated “*sanitation sector agencies should be invited to comment on draft disability legislation, with a view to remedying significant omissions and to discuss a framework for implementation*” (Wiman & Sandhu 2004:25).

2.7. Challenges to Education for disabled students

The purpose of accessible school sanitation is to facilitate inclusive education for disabled children, therefore this section outlines some of the barriers to education commonly cited.

2.7.1. International

2.7.1.1. Inclusive or Special Education?

As noted in 2.2.1.4, donor countries have moved towards the promotion of inclusive education.

The absence of alternative views provides little support to developing nations who have greater constraints on resources and often more negative cultural attitudes to disability which can constrain policies encouraging disabled children from attending mainstream schools (Polat 2011:50).

Save the Children state that “schools and authorities may believe that creating an education system that suits all children is too big and complex a task” and that governments and donors often “take the view that they cannot afford to educate all ‘mainstream’ children, let alone those considered to have extra support needs” (Save the Children UK 2008:13, 16). Inclusive education is thus seen as a separate activity rather than truly mainstreamed, a luxury only to be indulged where funds allow. This attitude parallels those encountered when trying to advocate for inclusive sanitation facilities in schools. The perception of additional cost for inclusive education concurs with the EFA GMR 2010 report (UNESCO 2010:119).

Thus the EFA view with regard to the cost of inclusive education is at odds with Save the Children, who insist that “inclusive education does not have to be expensive” (Save the Children UK 2008:14, Peters 2004:23). However most of the literature discusses the overall costs of inclusive education, not specifically accessible infrastructure or sanitation costs.

2.7.1.2. Physical Inaccessibility

The need for barrier free environments in schools is noted in both the NPD (URT MoLYS 2004) and the draft NSIE (URT MoEVT 2011). However neither specify appropriate regulations or standards to assist implementation of the policy statements.

The 2011 World Report on Disability identified the following school interventions to facilitate inclusive education:

- | | |
|---|--|
| <ul style="list-style-type: none">• Learner centred approaches• Additional teaching and health support• Building teacher capacity | <ul style="list-style-type: none">• Removing physical barriers• Overcoming negative attitudes of teachers |
|---|--|

The section on removing physical barriers is only one paragraph out of three pages of recommendations, and refers to the oft cited “1%” additional cost of accessible infrastructure referred to in 2.6.1. (WHO 2011:220-223)

Save the Children’s report “Making Schools Inclusive” also found it difficult to pinpoint those changes needed to deliver inclusive education (Save the Children UK 2008:9). They refer to inflexible and discriminatory education systems even where resources are available (Save the Children UK 2008:10). Of the eight identified barriers, “inaccessible environment” is only one of the problems though Save the Children note that “modifications to the material set-up of schools can be valuable” (Save the Children UK 2008:14).

They also acknowledge that targeted interventions to increase access to education can be wasted if not accompanied by wider changes in policy and practice throughout the education sector and

society at large (Save the Children UK 2008:14,15).

2.7.2. Tanzanian barriers to education

Despite being one of a number of low income countries that have made significant progress in increasing UPE through the introduction of free primary education in 2001 with the implementation of the PEDP, MoEVT assessed that literacy levels had in fact dropped between 1986 and 2009 (Kabendera 2009) although out-of-school numbers have reduced by over 3 million between 1999 and 2007 (UNESCO 2010:56). UPE is just about keeping track with population growth rather than making progress towards the targets.

2.7.2.1. Statistical data

Household Budget Survey 2007

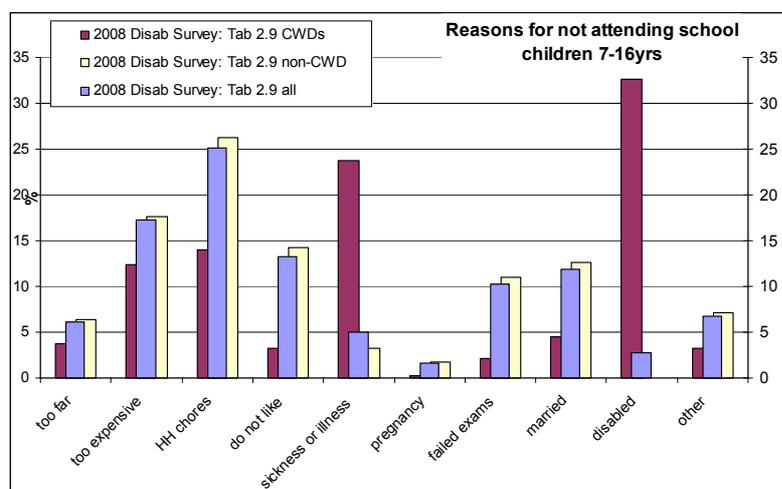
2007 Tanzania HBS reports “reasons for not attending” by 7 to 13 year olds on the Mainland, but does not disaggregate for disabled children. The category of “illness/pregnancy” does not provide sufficient information to determine any relationship with disability (URT NBS 2009:25-26).

Infrastructure and sanitation are not mentioned as barriers to education.

2008 National Disability Survey

The 2008 NDS recorded the reasons for children failing to attend school, disaggregated by disability status. Although the issue of accessing school is raised, accessibility within school is not, and sanitation is also not mentioned. Whether physical accessibility within school is captured within “other” is not known (Fig 2.12).

Figure 2-12: 2008 NDS “reasons for not attending”



Health barriers account for 50% of non-attendance (URT NBS 2008:22). For disabled students, the top causes are “disability” and “sickness or illness”. It is not clear what aspect of “disability” is the barrier, but “sickness or illness” could be an alternative method of recording disability (URT NBS 2008:124). Interestingly, no responses relating to negative school, community or

family attitudes to disabled children’s education were recorded, although these “reasons” had been anticipated during the survey design (URT NBS 2008:124).

Concern is raised by a statement that “15.5% [of disabled children] were refused entry to school because of their disability” with “highest refusal of 8.4% ..in regard to regular primary schools” (URT NBS 2008:98) however it is not clear what the justifications for refusal are. A 2005 assessment in the Tanga region reports one interviewee saying that the only reason he had been refused enrolment was because he was disabled, and not due to lack of facilities (Tanga Coalition 2005:16)

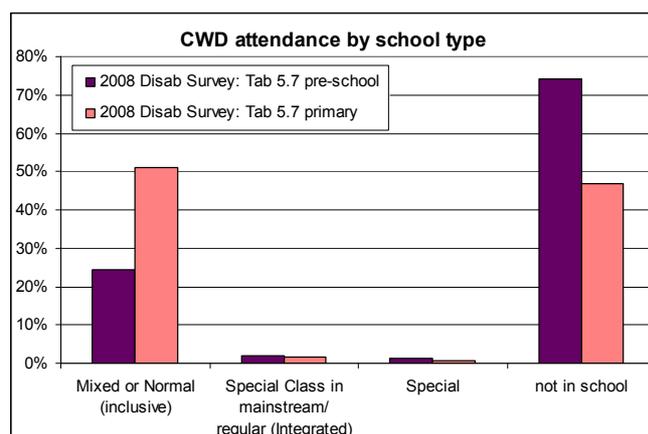
2.7.2.2. Limited space in special education

Special schools in most countries are located in national capitals or there are a handful of institutions to serve the entire country. Often they are residential and this was noted as a barrier to many due to

the associated costs, both to families and government, as well as resulting in “abandonment” of children by families (Philemon 2009, Guardian Reporter 2009). Hence the ability of disabled children to successfully attend mainstream or inclusive schools is critical until such time as sufficient special schools can be established.

A 2011 review of disability rights in Tanzania states that there are 16 special schools and 159 special units in Tanzania, integrated into mainstream schools (NIDS et al 2011). At a 2007 conference the Zanzibar Association of the Disabled (Shivyawata) reported that URT was actively “sensitising parents to send their disabled children to school”. Yet many disabled people themselves

Figure 2-13: Disabled students by school type



were “divided on the issue of inclusion” and though they “would prefer the special education model...acknowledge that there are no[t] enough schools..so the consensus is that it is better to have inclusive schools than to miss education altogether” (Maswanyana 2007:14).

Fig 2.13 is based on 2008 NDS Data and indicates how many children of official pre and primary school age are failing to be included in education as well as the very low numbers that are able to access Special Education.

2.7.2.3. Expanding Inclusive Education

It is not easy to identify robust evidence of URT’s inclusive education strategy in practice, e.g. recognising schools, supporting teachers, providing training and resources; or of the specific barriers to progress. Although the NSIE has only recently been released, the concept and promotion of inclusive education over special education has been in place for some time. The exact timetable for the activities of the NSIE is not stated in the strategy document although it is supposed to be implemented between 2009 and 2017 (URT MoEVT 2011).

MoEVT has identified a number of methods and strategies to include children with disabilities but no concrete evidence of specific and mandatory barrier free school provision could be located (GoT 2005 pp86). As will be explained in 2.8.3.3, the MKUKUTA target of 20% of disabled children enrolled in primary education by 2010 has already been missed.

2.7.2.4. Social and attitudinal barriers to education for disabled children

Some communities still do not value education for their children. In 2009 MoEVT estimated that 1.5m children remained “locked out of basic education” and ascribed this to “some tribes’ perception that education was a waste of time” (Kabendera 2009).

Cultural or religious beliefs relating to disability may make parents ashamed, or teachers and students afraid to accept disabled students, leading to discriminatory attitudes (Save the Children UK 2008:23). Hence, placing value on education of disabled children requires particular effort (Save the Children UK 2008:15, 23, 24)

Gender bias

Although primary schools do not find any bias in overall enrolment of boys and girls, both BEST 2010

and the 2008 HakiElimu study found that more disabled boys were enrolled than disabled girls (HakiElimu 2008, URT MoEVT 2010) which is consistent with DFID findings (DFID 2001:17). This may be due to concerns about security, both reaching and within the school environs (Polat 2011:56, Pearson 2011), but could also be related to the general problem of lack of sanitation facilities for girls (Redhouse 2004), although there is no evidence of this specifically for disabled children.

2.7.2.5. General environmental barriers to education for disabled children

There are two aspects to the issue of educational infrastructure in Tanzania, lack of infrastructure and lack of accessibility. A 2006 education sector review identified insufficient infrastructure, including toilets (TENMET 2007) as a challenge, and therefore barrier free infrastructure is competing in an environment where basic provision is lacking.

Interest in Barrier Free infrastructure

Research by Save the Children found that health concerns relating to physical distance to school coupled with the poor condition of school infrastructure accounted for 30% of absences (Save the Children UK 2008:32). Although it is unclear if these were specific to disabled students or elicited from the general school population, these factors will obviously have greater impact on disabled students than their able-bodied peers

Handicap International and CBM identify the need for accessible infrastructure and accessible sanitation in their 2006 report on "Making PRSP Inclusive" (HI & CBM 2006:71,75)

DFID – EdQual

An ongoing study for implementing education quality in LICs, including Tanzania, identified both "infrastructure" and "water and sanitation" amongst five objectives prioritised by teachers at sixteen schools for achievement by 2011 (Polat 2011:54-56). However, the researchers note that the apparent focus on infrastructure and resource related obstacles may reflect perceptions that "*unless resource related barriers are removed, cultural barriers cannot be challenged*" which supports the Save the Children findings (Save the Children UK 2008:13).

However both DFID and Save the Children suggest that "*negative cultural practice and poverty*" remain barriers despite improvements in infrastructure (Polat 2011:56) and that in fact "*lack of resources...should never be seen as a total barrier to making education more inclusive, because there is so much that can be done without extra money*" (Save the Children UK 2008:49).

WSSCC 2009 Tanzania Sanitation Sector Status and Gap Analysis

With regard to the sanitation aspect of inclusive education, a national study for the Global Sanitation Fund identified three "*cross cutting challenges*" including "*lack of gender responsive and special needs responsive school WASH designs and facilities*" (Chaggu 2009 p 23).

Tanzanian Education and Disability Organisations

A 1996 study of education for disabled people noted both infrastructure and sanitation as barriers, "*most of the buildings in our school do not facilitate mobility for the disabled. It is hard to imagine a student who walks on [all] fours using the common toilets*" (Possi 1996 p165).

Yet in 2007 nothing appeared to have changed according to a presentation by Shivyawata which reported "*accessibility not considered when building the school and classrooms*" amongst four key barriers, but does not identify how they would be tackled (Maswany 2007 pp13,15).

Poor physical infrastructure was identified by the 2008 HakiElimu study as being a major constraint to

education of students with disabilities, with 95% of school buildings failing to take account of their needs, even those constructed as part of the PEDP programme (HakiElimu 2008).

A study conducted in the Tanga region of Tanzania identified the lack of accessible facilities as well as the poor state of facilities in mainstream schools and the lack of special latrines was identified. (Tanga Coalition 2005:14). TENMET also identify infrastructure as a barrier to inclusive education on their website (TENMET 2008)

2.7.2.6. Sanitation barriers to education for disabled children

There is little quantitative evidence that sanitation is a specific barrier to disabled students, but anecdotal evidence of either school accessibility (Menya & Safu 2005) or sanitation accessibility (Cabot 2010, Wilbur 2011) being a barrier to students exists.

One of the most detailed and relevant studies of the topic was conducted by HakiElimu in 2008 which identified inaccessibility as the principal barrier to equal educational access and includes mention of toilets (HakiElimu 2008).

Anecdotal evidence was cited by a MoEVT School Health Programme Focal Person in 2009 who said *“it is true that inadequate water and sanitation has caused low enrolment, reduced attendance and retention of pupils”* at a TENMET conference. At the same event WaterAid Tanzania said *“better access to safe water, including supplies at schools, reduces time spent in collecting water and in turn, increases time for education”* (IPP Media 2009).

In summary whilst the absence of WASH facilities in schools is anecdotally a barrier to attendance, both amongst girls and the disabled, the relationship between disability and school attendance is poorly documented

2.8. Inclusive Schools and Accessible School Sanitation

This section reviews the developments in school sanitation to consider the specific needs of children and reviews some of the existing technical guidelines for physical infrastructure. In light of the health and economic benefits referred to in 2.4, extensive justification of school sanitation for educational is not thought to be necessary since there is extensive literature on the subject.

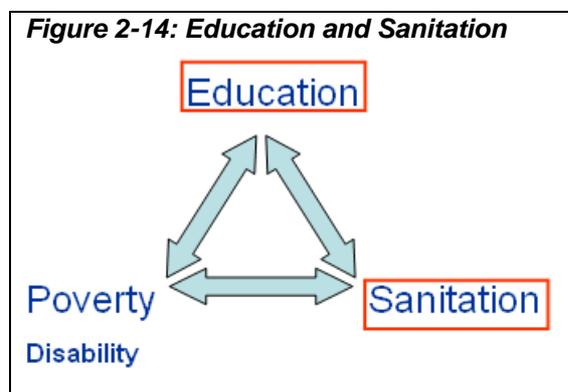
Extensive literature exists on the economic, health and learning benefits of sanitation in schools (Mwendwa et al 2009:6, Bosch et al. 2001, WaterAid 2007, UN Water 2008).

Sanitation interventions can be justified from the perspective of the economic potential of children countered against the potential health and welfare costs of supporting ill, uneducated and therefore unproductive citizens (Fig 2.8-1) (Mwendwa, Murangira & Lang 2009, Metts 2000 p26).

2.8.1. The need for School Sanitation

Since the data on education impacts is so poor, it is very hard to ascribe any educational improvement to any specific intervention. However, as noted in 2.3.2.3 a greater interest in sanitation interventions for education than for disability interventions (Jones & Reed 2003:17) has resulted in a variety of programme approaches for school sanitation (Government of India & UNICEF 2008:3).

- SWatsan – School Water and Sanitation
- SLTS – School Led Total Sanitation



- SSHE – School Sanitation, Hygiene and Education
- SWASH – School Water, Sanitation and Hygiene

The desirability of effective sanitation and hygiene in schools is readily accepted. Levels of absenteeism, long term illness, development of permanent disabilities and child mortality can be reduced by behavioural education and practice at school and campaigns to improve school sanitation are undertaken by numerous multi and bi-lateral agencies as well as INGOS (Redhouse 2004, UNICEF 2010). There are a number of collaborative efforts to tackle school education including The 2000 Focusing Resources on Effective School Health (FRESH) partnership between the WB, UNICEF, UNESCO and WHO which is founded on the link between sanitation and improved learning experiences in formal education, but does not strongly address disability issues.

In order to provide further justification for accessibility interventions, the researcher sought out data on monitoring of school sanitation programmes, however there is little evidence showing direct causality between sanitation and improved education or inclusive education enrolment, attendance or completion. (Collender et al 2011:4)

2.8.1.1. School Sanitation in Tanzania

Despite the international activities in school sanitation a 2009 analysis of Women, Children and Water, Sanitation and Hygiene in Tanzania reported that *“WASH facilities and practices in schools ...has attracted very little attention from policy makers”* (Taylor 2009:i). URT’s own policy and strategy documents are unclear on how the impacts of SWASH objectives and inclusive education are being measured, merely measuring “coverage” of sanitation and percentage increase in disabled students despite the base population of disabled children remaining unquantified.

The NSIE (URT MoeVT 2011) has a wider goal of increasing UPE, and therefore uses enrolment rates, attendance rates, primary school completion rates and literacy as indicators, but none of these can be linked to accessible sanitation interventions.

In 2009 WaterAid Tanzania identified six links between water, sanitation and education (Malima 2009).

- Safe water and sanitation leads to better health, which increases school attendance and ability to learn
- Better access to safe water, including supplies at school, reduces time spent collecting water and increase time for education
- Lack of privacy and safety for girls needing the toilet discourages girls from attending schools without adequate latrines
- Lack of water and sanitation prevents girls attending school during menstruation
- Hygiene education for girls increases chances of their future children surviving
- Where there is a lack of water supply at schools, teachers are less willing to accept postings

But the specific needs and benefits to disabled students are not highlighted.

As the data on students with disabilities is so poor it is difficult to determine which are the main barriers to their education and whether improved school sanitation has a significant impact.

There is little proof of the benefits of accessible sanitation for disabled children, probably because accessible sanitation is so rarely found. There is greater anecdotal evidence of the disadvantages of inaccessible school sanitation resulting in embarrassment, lost dignity, hygiene problems and missed

school days (EENET 2010:22).

However, long term data on enrolment, attendance or grades is not available and it is certainly not possible to attribute changes to improved sanitation alone.

2.8.2. Child Friendly Schools and sanitation

Children have been identified as a particularly vulnerable group in respect of sanitation programmes and changes to school sanitation delivery have resulted from the Child Friendly School approach.

However quantitative progress or evaluation evidence was difficult to find.

The IRC and UNICEF were the main promoters of the Child Friendly Schools concept from the late 1990's (Carriger 2007, Zomerplaag & Mooijman 2005). A similar approach was advocated by the World Bank in its "Toolkit on Hygiene Sanitation and Water in Schools" (World Bank WSP 2005).

The main element of Child Friendly designs was the adjustment of heights and sizes of infrastructure, with attention to WASH as well as other school facilities. The proximity and siting of facilities was also highlighted as well as creating bright welcoming spaces rather than dark frightening facilities.

Attention was drawn to features which required consideration such as the height of door handles, but explicit technical standards were avoided, instead promoting school specific approach. Child Friendly School activities also emphasised the importance of hygiene education and facilities management in relation to WASH. Although the concept identified the specific needs of girl children there was little recognition of disabled students' needs (Carriger 2007, Zomerplaag & Mooijman 2005).

Interestingly the three relevant adaptations of steps, handrails and small toilet seats were initially identified for small children rather than disabled children (World Bank WSP 2005).

UNICEF used the approach in a number of countries where specific technical guidelines were developed and the needs of disabled children were more consistently included (UNICEF Sri Lanka 2009; Mooijman et al 2009:192-199)

A EENET Newsletter included a special feature specifically addressing accessible school sanitation, supported by WaterAid, with articles from WaterAid, Concern Worldwide and Leonard Cheshire (EENET 2010:9,20,22)

The WB recognises inaccessible school environments as a problem (World Bank 2007:16) and provides general guidance in a 2007 note on incorporating disability into projects. The same report identifies failure to include disabled people's needs in planning of water and sanitation projects (World Bank 2007:8). It notes the opportunity to facilitate and promote barrier free design for schools but does not confirm if that this would be mandatory for WB projects (World Bank 2007:21).

Despite these developments, other guidelines and standards from donors, NGOs and governments often failed to consider disability issues at all including a 2009 UNICEF country report on Equity in School Water and Sanitation (UNICEF Regional Office for South Asia 2009).

2.8.3. School inclusivity and sanitation objectives in Tanzania

2.8.3.1. 2004 National Policy on Disability

The various requirements within the National Policy on Disability (NPD) to provide accessible public infrastructure as well as equitable access to education for disabled children will be addressed in 2.9.4.2.

2.8.3.2. 2011 National Sanitation and Hygiene Policy

Section 5.2 of the National Sanitation and Hygiene Policy identifies the need to provide "improved

latrines in schools which comply with dignity, age, sex with emphasis on the needs of girls” but does not identify the needs of disabled students (URT MoHSW 2011:13).

2.8.3.3. Relevant MKUKUTA Objectives

URT’s inclusion of two relevant “operational targets” in it’s MKUKUTA I (2005-2010) document recognise the need for increased sanitation and inclusive education to address poverty (Fig 2.15) (GoT 2005:93, 101)

Figure 2-15: Relevant MKUKUTA goals

Cluster	Goal	Operational Target	
2. Improvement in Quality of Life and Social Well Being GoT, V.P.O. 2005 Annex :14,22	1. Ensuring equitable access to quality primary and secondary education for boys and girls, universal literacy among men and women and expansion of higher, technical and vocational training	B. Primary Enrolment	1.3. Increased proportion of children with disabilities enrolled, attend in and completing schools from 0.1% in 2000 to 20%in 2010
	3. Increased access to clean, affordable and safe water, sanitation, decent shelter and a safe and sustainable environment and thereby, reduced vulnerability from environmental risk	B. Sanitation & Water Management	3.4 100% of schools to have adequate sanitation facilities by 2010.

Despite these targets, progress towards the Goal 2:1 was not assessed in the 2009/10 MAIR (GoT, Ministry of Finance and Economic Affairs 2010:43) instead only reporting the number of enrolled disabled students. The absence of baseline data on prevalence of disability amongst primary school aged children as noted in 2.2.5 and 2.8.1.1 prevents assessment of progress to be made (HakiElimu 2008:7).

For Goal 2:3 MAIR notes that the increase in absolute school latrine numbers had not kept pace with enrolments and that only 11% of schools meet the MoEVT student: latrine target ratios, whilst 6% have no latrines at all. Functionality and accessibility of the latrines is not clear (GoT, Ministry of Finance and Economic Affairs 2010:58). It seems both these goals have since been shifted to MKUKUTA II’s target data of 2014 (Chaggu 2009:18).

BEST 2010 reports average student: latrine ratios of 56:1 and that “*the shortage of latrines and classrooms is still a big problem in schools with big variations among regions*” (URT MoEVT 2010). There is no indication of type and condition of the toilets.

MKUKUTA I identified 12 interventions required to improve equitable access to quality education, including some specific interventions for disabled children (GoT 2005 Annex:14-15) regarding physical accessibility, but only two relate to infrastructure and no details of specific activities, monitoring indicators or progress could be found.

- | | |
|-------------------------|--------------------------|
| • School infrastructure | • Shelter infrastructure |
|-------------------------|--------------------------|

The failure of the MKUKUTA I to have made much progress on either of these targets and, in the case of enrolment of disabled children, even have an accurate baseline for assessment is consistent with international findings that education authorities introduce “*positive and ambitious policy statements, but have no plan of action or resources for implementing tem*” (Save the Children UK 2008:16).

It is clear that Tanzanian inclusive education policies and strategies are diverse and require budgets

to be dispersed to many areas, making it all the more difficult to assess which have the greatest impact on disabled children's education. As noted in Section 2.2.5 progress towards inclusive education is unlikely when the sector has little idea which *"changes would make the biggest difference"* (Save the Children UK 2008:15).

2.8.3.4. Accessibility is not mandatory

Typical School Sanitation guidelines come in many formats, often providing a "menu" of sanitation designs, some of which are accessible (GoI & UNICEF 2008). However this approach suggests that inclusivity is not mandatory but that schools can opt not to provide any accessibility features. As noted in 2.6.2.1 a similar optional approach appears to have been adopted in the NSIE. It is notable also that the MoEVT Secondary Education Development Plan (SEDP) standard latrine designs; which are similar to those for PEDP; include a number of layouts which have no accessibility features (URT MoEVT 2007) many failing to comply with Chapter 5 *"Accommodation for students with Disabilities"* of the SEDP Technical Handbook (URT MoEVT 2004:40-41). This also prevents benefits of accessible sanitation being reaped by other students who may be temporarily ill or injured. The literature reviewed in 2.3.2.3 and 2.8.2 indicates that although there are many donors in the education and sanitation sectors (Metts 2000:xv, Chaggu 2009:15) who claim to include disability issues in their project planning, few currently enforce it's application, instead relying on national standards and designs.

2.9. Institutional Environment relating to accessible infrastructure

This section identifies some of the relevant legal requirements for both accessible sanitation and inclusive education in Tanzania for the main purpose of identifying those stakeholders to be contacted during the field research, the relevant regulations and technical guidelines.

2.9.1. Basic human rights to education and sanitation

The rights of children and the disabled are underwritten by various international and national conventions including the right to quality education (Polat 2011:57). Exercising the legal right to accessible infrastructure in order to access education is an important step towards ensuring accessible sanitation is provided in schools.

A 2010 report on DFID's education interventions identified the gaps in implementing programmes which catered for disabled children noting that *"one of the main barriers to the inclusion of children with disabilities is a common failure to consider their access requirements as a central and integral part of ...planning and implementation"* (Modern et al 2010).

2.9.2. Relevant Legislation

2.9.2.1. The right to education

The EFA Global Monitoring Report 2010 states that *"Denying children an opportunity to put even a first step on the education ladder sets them on a course for a lifetime of disadvantage. It violates their basic human right to an education. It also wastes a precious natural resource and potential driver of economic growth"* (UNESCO 2010 pp55).

The legislation relating to every the right to education in Tanzania is included in:

- Article 26 of the Universal Declaration of Human Rights (UN 1948).
- 1978 Education Act – *"every Tanzanian has the right to receive such category, nature and level of education as his/her ability may permit"*

- 1989 UN Convention on the Rights of the Child
- 1993 Standard Rules on Equalisation of Opportunities for People with Disability – Rule No. 6: where education is compulsory this includes children with all kinds and levels of disability (Possi 1996)
- 2009 - Child Act - safeguards child rights in line with international and regional conventions (GoT, Ministry of Finance and Economic Affairs 2010:62).

2.9.2.2. Disability rights

- 1977 Constitution of Tanzania - recognises disability rights and prohibits discrimination (URT MoLYS 2004:1).
- 1975 UN Rights of People with Disabilities – Tanzania is a signatory
- 1993 Standard Rules on Equalisation of Opportunities for People with Disability – Rule No. 5: requirement for those involved in design of the physical environment to know about disability policy and measures to achieve accessibility (Possi 1996)
- 2004 National Policy on Disability (NPD) - assures access to information on rights as well as education for disabled people (URT MoLYS 2004).
- 2005 MKUKUTA I for mainland Tanzania - recognises disability as a main cause of poverty (NIDS et al 2011).
- 2009 United Nations Convention on the Rights of Persons with Disabilities (CRPD) ratified by Tanzania (UN Enable n.d.).
- 2010 Disability Act - a National Advisory Council and relevant policies, programmes and best practices are to be developed including regulations for access to public buildings (URT 2010).

2.9.3. Responsibility for Disability Issues

MoEVT is responsible to protect the educational rights of disabled children to education whilst the Department of Social Welfare, located within the MoHSW, is responsible for coordinating all disability issues (NIDS et al 2011, Kisungwe 2010).

2.9.4. Legal enforcement of accessibility in Tanzania

Fig 2.16 below depicts the relevant legislation and standards relating to accessible school sanitation as understood by this literature review. It is clear that policy and strategy on accessibility is being developed at a number of levels, although not all the specific regulations could be located. However a 2011 paper which reviewed the 2004 National Policy on Disability noted “*a clear discrepancy between rhetoric and reality*” and that “*accountability..is still largely absent in NPD*” (Aldersey, Turnbull 2011:9) a view also held by TENMET (TENMET 2009) and CBM (Handicap International & CBM 2006:38).

2.9.4.1. Access to Education

Legal provisions for primary school enrolment were put in place to support the free compulsory primary education policy (Vahaye 2011).

Recognising the need for targeted action to achieve the MKUKUTA goals for disabled people, the MKUKUTA Disability Network was created, but its activities in relation to inclusive education are mainly confined to the Morogoro and Bagamoyo districts and have little success in influencing national plans (2.2.6) (Fritz et al. 2009).

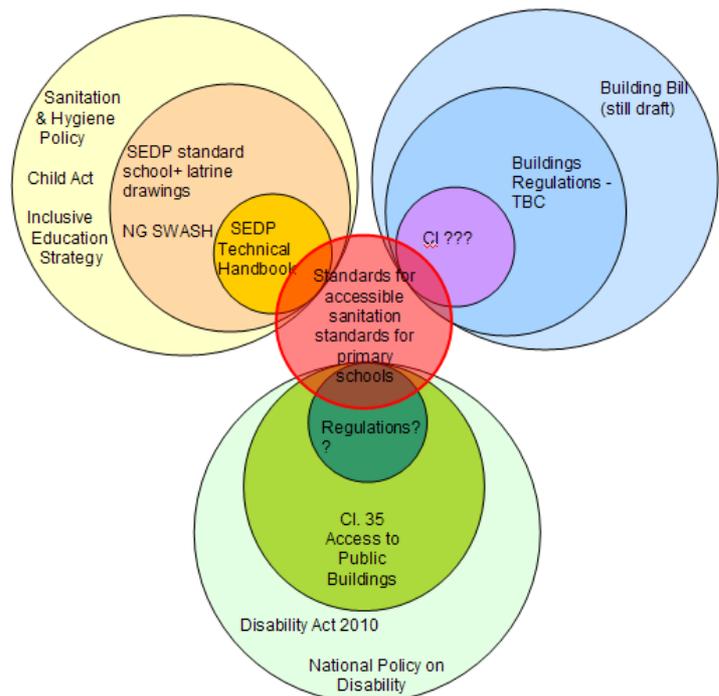
No specific regulation could be located in the literature but sources inferred that failure to enrol

children in primary school may be subject to penalties (Vahaye 2011).

In addition despite the government's commitments to providing equitable access to education for all, there is also evidence that schools can refuse admission to students as noted in 2.7.2.1 (URT NBS 2008:98). The rules identifying valid grounds for refusal are not clear from the literature.

A 2005 assessment supported by the commonwealth Education Fund reported that *"there appears to be no national strategy to ensuring that disabled children and other marginalised children enrol and attend school"* (Tanga Coalition 2005:7), a situation the 2011 NSIE is presumably designed to address.

Figure 2-16: Tanzanian legislation and standards



2.9.4.2. Physical accessibility

Box 2.1: Guarantee of Physical Accessibility

"The government in collaboration with stakeholders shall take measures to ensure that public buildings and other facilities are accessible to people with disabilities."

Policy Statement, CI 3.11 (URT MoLYS 2004:17)

Despite this policy requirement the current state of disability related legislation, regulation and standard setting within Tanzania suggests that coordination is not as it could be (Kisungwe 2010, Aldersey & Turnbull 2011, Gummich 2011).

The Tanzanian Bureau of Standards is the relevant authority for defining standards in the country, but has none relating to accessibility at this time. None of the international standards on accessibility are recognised by the Tanzanian government at this time (Kisungwe 2010, Gummich 2011).

A Draft Buildings Bill has been awaiting finalisation in Parliament for a number of years and is said to further elaborate on the accessibility requirements but not nearly to the satisfaction of the two professionals contacted and a copy of the bill could not be acquired for review (Gummich 2011, Boon 2011).

2.9.4.3. Technical guidelines and standards

Guidelines and standards for school buildings are the responsibility of MoEVT. However, actual construction drawings may be draughted by the relevant school authorities or private contractors on behalf of schools.

Even though the SEDP Technical Handbook includes an entire Chapter on "Accommodation for Students with Disabilities" (URT MoEVT 2004), many of the current teaching facility drawings fail to comply with basic accessibility principles, whilst even fewer provide specific facilities for disabled children (URT MoEVT 2007). Of note is the fact that only one of the three MoEVT designs selected for inclusion in the draft National Guideline for School Water Sanitation and Hygiene (NG SWASH) is

a design with provision for disabled children (URT MoHSW 2010).

School sanitation initiatives in Tanzania are currently spearheaded by NGOs although the NG SWASH has managed to bring together the four key ministries (URT MoHSW 2010) who now have a Memorandum of Understanding (MoU) on this issue. The only overlap between these agencies and those responsible for disability rights is in MoHSW who, as noted in 2.8.3.2 have failed to include disability issues in the draft national sanitation and hygiene policy.

Mainstreaming accessibility into education and sanitation therefore remains a challenge (Malima 2011, Vahaye 2011, Gummich 2011).

CHAWATA (Tanzania Association of the Physically Handicapped) developed a number of advocacy factsheets through the government's Business Environment Strengthening for Tanzania – Advocacy Component (BEST-AC) programme outlining some technical standards for physical accessibility (CHAWATA 2008). It is not known how and to whom these were disseminated.

2.10. Defining and Assessing Accessibility Compliance

This section reviews some of the internationally recognised methods for assessing accessibility of infrastructure, and sanitation in particular.

2.10.1. Technical Standards

Sections 2.2.7, 2.4.4 and 2.8.2 have identified some disability friendly guidelines in place for general infrastructure, sanitation and school sanitation purposes, with fewer documents found as the scope narrows.

For Tanzania, the draft NG SWASH is currently being piloted. It is the product of collaboration between the four key ministries noted in 2.9.4.3 and covers a range of activities from planning, construction, O&M and governance. Toolkit No.2 Parts 1 and 2 provide technical guidance on sanitation construction. It includes sample designs from MoEVT, a “modified WEDC” design and designs by a local architect, EEPSCO, for latrines of all technology types (URT MoHSW 2010).

2.10.2. Methods for assessing accessibility

There are few guidelines currently in existence which are directly relevant to a developing country context and only a handful of documents which could be reliably referred to as Accessibility Audit for sanitation facilities. The absence of standard approaches affects consistent measurement of “accessibility” in a replicable or objective way.

Most systems use a checklist approach (Jones 2010, Jones & Reed 2005:281) which risks misinterpretation if undertaken by inexperienced personnel, however the lack of guidance in general appears to be an obstacle to effective implementation.

A brief overview of some typical accessibility audit approaches follows.

2.10.2.1. UK Equality Act

The UK 2010 Equality Act defines the legal rights of disabled people's access to facilities using a universal design approach. Disabled toilets in the UK are generally accessible by non-disabled people where a standard cubicle has insufficient space for their use.

Part M of Schedule 1 of the Building Regulations, which apply in England & Wales, provides technical guidance with respect to Access To and Use of Buildings (Her Majesty's Government, Office of the Deputy Prime Minister 2004).

To enable assessment, Part M includes a series of checklists relating to access for external and

internal accessibility including specific checklists for ambulant and non-ambulant toilet facilities, with scores from 1 to 3 given for level of compliance.

Local Authority Access Officers can issue rectification notices for failure to comply with the regulations which must be implemented within 28 days of notification. Fines of up to £5000 can be levied for the contravention with additional daily fines for late rectification.

2.10.2.2. US: Universal Design Performance Measures for Products

The Centre of Universal Design's (CUD) Performance Measurement principles were developed for both infrastructure and products, therefore it is necessary to interpret the indicators for each of the seven principles since they are not immediately applicable to sanitation.

1. Equitable Use
2. Flexibility in Use
3. Simple and Intuitive Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach and Use

For each of the seven measures, four statements are scored from 1-7 corresponding with levels of agreement with the statement. For example:

Principle Seven: Size and Space for approach and Use

7A It is easy for a person of any size to see all the important elements of this product from any position (e.g., standing or seated).

The CUD measures are not legally enforceable and accessibility in the US is governed by both federal and state laws, stemming both from civil and disability rights as well as building regulations and standards including the Federal ADA Accessibility Guidelines for Buildings and Facilities.

2.10.2.3. South Africa

The South African Bureau of Standards has recently updated the National Building Regulations, which include Part S relating to: Facilities for persons with disabilities (RSA: SANS 10400: Part S) In addition to general standards on external and internal access Section 4.11 outlines the requirements for toilet facilities.

- Buildings in which accessible toilets are required
 - Details for wheelchair accessible toilets
- Annex D provides further guidance on the design and layout of toilets, suggesting taps and handles to be at least 100 long and operable with one hand.

2.10.2.4. WEDC Accessibility Audit

Appendix 4 of "Water and sanitation for disabled people" referred to the Disability Wales' Access Survey Checklist for Building Elements which applies the UK DDA checklist approach (Jones * Reed 2005).

WEDC has since developed a more detailed Accessibility Audit format specifically for sanitation which addresses various aspects of use and asks questions to guide the assessor. Unlike the DDA and US CUD approaches it does not use a rigid scoring system but requires the auditor to note their observations and assessment.

- Getting there
- Getting in/on
- Inside
- Water/anal cleansing materials
- Hand-washing
- Other issues
- Support structures

2.10.2.5. Water Aid

Water Aid has produced a number of guidelines and briefing sheets as noted in 2.4.4. Although these provide some technical details they do not provide any guidance on assessing accessibility, instead focusing on the process of including disability issues in project design (WaterAid Madagascar 2010, EENET 2010:13)

2.10.3. Methods for assessing School Sanitation

Some of the Child Friendly School guidelines and documents include various checklists for reviewing accessibility. The “Index for Inclusion”, published by the Centre for Studies on Inclusive Education is one of a number of approaches which provides a checklist to help schools to identify barriers to inclusive education (Polat 2011:54, Save the Children UK 2008:36) but covers all aspects of accessibility including governance, planning, teaching with little detail on physical standards.

2.10.4. Critical features or features for specific disabilities

Appreciating that governments or projects may have constrained budgets a pragmatic approach is needed when considering accessibility features for inclusion in designs. For example, in a rural area with rocky footpaths in hilly terrain it would be illogical to assess a ramp as non-compliant because it lacked kerbs. The Government of India/ UNICEF School Sanitation and Hygiene Education 2008 Guideline identifies that of the various features that enable accessibility, some are critical and some desirable (Government of India & UNICEF 2008:17) and detailed designs have been developed for a range of combinations (2.8.3.4).

Therefore it is clear that a “hierarchy” of features exists and if funds are limited one can select from this menu of features. However some features cannot be easily retrofitted.

Other documents identify which particular accessibility features benefit particular disability types enabling design to be influenced depending on the intended users (Jones 2011, UNICEF et al 2004). Fig 2-17 compares criteria for different features from various guidelines, some specifically for school contexts, identifying the gaps and conflicts in assessment criteria.

Figure 2-17: Comparison of Infrastructure Accessibility criteria

	URT NG SWASH (2010 draft)	WEDC (Jones, Reed 2005)	MoEVT SEDP (URT MoEVT 2004)	Gol and UNICEF (Government of India, UNICEF 2008)	IRC (Zomerplaag, Mooijman 2005)	WEDC (Reed, Shaw & Chatterton 2008)	Building Regulations 2000 (Her Majesty's Government, Office of the Deputy Prime Minister 2004)	Handicap International (David 2008)	UNAPD (Uganda National Action on Physical Disability (UNAPD), Ministry of Gender, Labour and Social Development 2010)	SANS 10400:S 2011 (SABS)
Country date	Tanzania Draft 2010	Uganda, Cambodia, Bangladesh	Tanzania 2004	India 2008		Kenya 2008	UK 2010	Cambodia 2008	Uganda	South Africa 2011
Context	Schools	Non-school	School	School	Schools	Primary schools	Non-school	Non-school	Non- school	Non-school
Section	Toolkit 2	Chapter 5	Chapter 5		5		5.11 Toilets in separate-sex washrooms		Chapter 8	Part S, Section 4.11
Latrine: student ratios	Girls 1:20 Boys 1:25 +urinal 1:50boys (length/ boy not stated)	1m/ 50 students		Girls 1:40 Boys 1:80 Urinal 1:20 boys (W=450/boy)		Girls 1:25 Boys 1:50 Urinal 1m/50boys				
Distance from classroom	<150m			1.5-18m depending on orientation wind/sun		10m between boy/ girl latrine blocks >15m to water point	40m			45m
Ramp	W=1200 <1:20 Landings at 10m c/c Kerb =50	W=1200 <1:15 Landings at 5m	W=1200 <5-7% Landings at 6m c/c Crossfall 1:50 for drainage Handrails H=1800	<1:12		1m wide <1:12 Ideally 1:20	-	W=1500 ≤8%		
Landing	L=1200	L=1250	L=500 either side of door	L=1500		W=1000 L=1200	-	L=1000	L=1500 W=1700	
Steps		H =150-170 W = 280-420								
Door	W=900 Outward opening	W>800 Outward opening or split leaf inward opening	W=820	W=800-1200 Inward opening	W=1000	W=800 Outward opening H=1800 in 2000 opening	? W=750 (no dim on drg)	W=900 H=2000	W=900 Outward opening	W=750 Outward opening unless 1.2m dia clear int space
Door handles/ locks	H=700-900 W=570 Int door bolt H=900-1200			H=693-1025	Varies by age group Max H=1050-1670		≤20N		H=750	Vert grab handle 19-25Ø Annex o/s =80mm o/s from hinge 250-300 H=700 L=300
Corridor	W=1000	W=1200				W=1000			W=1500	W=1100

	URT NG SWASH (2010 draft)	WEDC (Jones, Reed 2005)	MoEVT SEDP (URT MoEVT 2004)	Gol and UNICEF (Government of India, UNICEF 2008)	IRC (Zomerplaag, Mooijman 2005)	WEDC (Reed, Shaw & Chatterton 2008)	Building Regulations 2000 (Her Majesty's Government, Office of the Deputy Prime Minister 2004)	Handicap International (David 2008)	UNAPD (Uganda National Action on Physical Disability (UNAPD), Ministry of Gender, Labour and Social Development 2010)	SANS 10400:S 2011 (SABS)
Country date	Tanzania Draft 2010	Uganda, Cambodia, Bangladesh	Tanzania 2004	India 2008		Kenya 2008	UK 2010	Cambodia 2008	Uganda	South Africa 2011
Cubicle	W=1500 L=2000	Depends on use		W=1525 L=1775		L=1200 W=1500 (standard 1000x1200)	W=800 L= toilet+450+door rad Or L=toilet+750	W=1500 L=2000	L=2700 W=1800 L=toilet+1550	W=1800x1800 L=toilet+450mm
Internal cubicle manoeuvring space	1500	1500		Seat to be clear of inward opening door			450ø		1500ø	
Hori handrail	50mm Ø R=75 o/s=50-150 H=700-900 L=1400	H=750		H=600-780 L=674-828		H=800	H=680 L=600	40 ø o/s=150 H=700-900 L=1200	50mm Ø o/s =50 H=410-800	32-38mm/ 19-25Ø?? o/s =80mm H=800
Diag handrail	'-			H=690-852			H=600-800 Ang 15° L=600		H=540-800	
Vert handrail	'-			H=520 L=760			H=800-1400 L=600			
Toilet seat in cubicle	o/s >800 side o/s >300 back			o/s in corner	central		Central	central	central	o/s= 450-500 side wall to toilet centreline o/s 690 back wall to front toilet
Toilet seat	H=350 L=400 W=500 Opening 100x250			H=380	Varies by age group H=260-420	H=350 L=200 W=100 Opening=150 (F), 200 (B)	H=480mm	H=370-400 W=480 L=520 Opening=200	H=410 L=520 W=480 Opening=140	H=480-500
Tap/washbasin	H=500 1 tap:50 students		H=800	Tap H=368 HWB: Min 2, 1:20 students H=700	Varies by age group H=580-820	15l/child/day (day school) – pit latrines 120l/child/day – flush latrines 1 tap:50 students Within 10m of latrines	H=720-740	H=1100		H≤820 Tap handle L≥ 100mm Within reach of toilet

2.11. Assessing costs of inclusive school sanitation

This section reviews previous assessments of the “extra” cost of accessible infrastructure.

2.11.1. Costs for advocacy and planning

There is limited research on this topic making it difficult to advocate for inclusive infrastructure (DFID n.d:15). That larger cubicles, wider corridors, raised seats or handrails result in increases in capital costs cannot be denied but the lack of reliable data means that perception of the additional cost varies greatly and realistic budgets and plans cannot be developed. Without this data it is not possible to quantify the relative benefits of inclusive sanitation in comparison to medical costs or lost economic opportunity.

(2.4.1).

WaterAid Nepal say that accessibility “costs only marginally extra” and that is a “*common misconception that making services accessible...is costly*” (WaterAid Nepal n.d:5). A 2010 workshop presenter said that accessibility “*can be met in mainstream programmes by only minor changes at minimal cost*” (NCPD & Water Aid Ghana 2010:10).

A Handicap International study in Mali noted that costs are low, particularly if considered before construction (Horne & Debeaudrap 2007:24) as does a 2004 WB report on inclusive education number (Peters, S. 2004:40) and HI suggest it is less than 2% of the total construction cost (Handicap International 2009). None of these documents provide evidence to substantiate these statements However, assessing construction costs alone does not take into account the context of the full costs of a project, e.g. including administration, overheads, or the capital costs as part of the whole life costs (IRC 201a, IRC 2010b). This will be discussed further in 2.11.5

2.11.2. Cost assessment methods and findings

As already mentioned in Section 2.6.1, the approaches currently used to budget for education to reach the marginalised have already been identified as inappropriate (UNESCO 2010:119).

With regard to infrastructure provision, there are few sources of literature on the “additional” or “extra” cost of accessibility. The definition of “additional cost” is as yet not agreed but has variously been interpreted as the cost of features and fixtures included to aid accessibility, less the cost of standard sanitation elements.

Consideration of the methods and findings of the literature are outlined below.

2.11.2.1. South Africa

A figure often cited is a 1% additional cost (Edmonds 2005:56, Chaggu 2009:21, DFID n.d., Leathes 2009) which appears to originate from a 2000 WB report by Metts (Metts 2000).

The case studies on which the “additional cost” were based are summarised below:

Figure 2-18: Metts’ case studies				
Country/ year	Facility	Total construction cost (SAR)	Scope of accessibility provision	% extra
South Africa/ 1997	International Conference Centre, Durban	280,000,000	Upgrade from national to Intl accessibility standards (US,UK) during construction period	0.59%
South Africa/ 1998	Community Centre, Gugulethu	1,768,700	Accessible toilet, contrast paintwork, teletext eqmt	0.47%
South Africa/ 1991	Secondary School,	27 classrooms 4,955,300	Parking + ext access routes,	1.08%

	Durban (retrofit)		3 toilets, replacement of fittings +fittings doors+desks etc, signage	
South Africa/ >1997	Primary School, Gamalake	24 classrooms 4,603,700	Ext access ramp, toilets, signage	0.78%
South Africa/ 1996	Secondary School, Mzomhle	12 classrooms 954,600	Toilet block, ext access routes	0.69%

Whilst on aggregate this gives a 0.61% additional cost for general infrastructure accessibility provision, it is clear that the case studies cited are significantly different to the provision of school sanitation in developing countries. The Durban conference centre was upgraded to international accessibility standards including hearing teletext facilities. Only the Mzomhle school provided a pit latrine block equivalent to the type of facility provided in many LIC schools.

Also it is not clear if Metts has compared the cost of the accessible works with the total overall cost of the scheme; i.e. including the added accessibility elements; or on the original cost as some of these works were added to previously completed buildings. The retrospective nature of some of these works would also have an impact on cost assessment as they are usually more difficult and costly than those designed from the start (Snider, Takeda 2008 p6, Steinfeld 2005, Peters 2004 p 40). Hence the “extra cost of accessibility” varies greatly due to scope of works and the stage at which accessibility is added.

2.11.2.2. WA Madagascar

WaterAid Madagascar has piloted design and construction of accessible WASH facilities and identified the additional costs of latrine construction of accessibility based on a single school sanitation case study (WaterAid Madagascar 2010). For a latrine block providing 3 standard latrines and a urinal, inclusion of an accessible shower and latrine with associated ramp and internal accessible fixtures constituted 8% of the construction cost of a standard latrine, i.e. 7.5% of the whole cost of the latrine block (Fig 2.19).

Figure 2-19: Water Aid Madagascar cost of accessibility data

Design	(Costs in Ariary)	Standard components	Accessible components	Total	Extra cost/ standard block	"extra cost"/ total accessible block
WaterAid Madagascar	<i>no. cubicles</i>	3	1			
	<i>cubicle floor area</i>	2.10	3.32			
Latrine Scolaire	total cost	7,400,000	??	8000	8%	7.5%

The calculations clearly identify which “additional materials” have been included in the cost and state that differences in transport charges may apply in different circumstances. The approach used here is to compare the total cost of the block with an accessible cubicle against the price of the standard block. It is unclear if estimated costs include for labour or plant. Similarly, the cost of excavation for foundations, backfilling and temporary works have not been measured since only ‘above ground purchased’ materials have been identified.

The method of defining the “accessible elements” has not accounted for the fact that the accessible shower, being the only shower facility within the block, is presumably also used by non-disabled people. Hence, in the researcher’s view only the materials associated with the accessible cubicle should be measured together with materials for accessible fixtures.

2.11.2.3. World Vision Ethiopia

The WEDC MSc research undertaken in Ethiopia based on three WorldVision school latrines estimated extra construction cost of accessibility features at up to 3% on the total cost of the latrine block i.e. including accessibility features (Neba 2010). The study identifies the inclusion of ramps, handrails, seats and the extra concrete slab area of accessible cubicles. The corresponding Bill of Quantities (BoQ) rates were used to estimate value which are assumed to include the cost of labour, plant, materials, risk and overheads such as supervision that would have been included in the contractor's rates.

However the additional excavation and foundations works, reinforcement and falsework to slabs or roof components of new latrines due to the larger size of cubicles is not included and for one school the increased cost of wider doors is omitted.

2.11.3. Discussion of approaches

In comparing the costs estimated from the literature review a number of issues affecting comparison become clear.

1. Scope of total facility – international conference centre or 4 cubicle latrine, affects proportion that “accessibility” accounts for, economies of scale, contractor experience, capacity and management of risk, overheads and health and safety (Leathes 2009)
2. Standard of construction – minimum specifications for design and materials
3. Quality of construction – minimum standards or workmanship (skills) and quality management
4. Location – rural likely to have higher materials and transport costs urban higher land costs and pit latrines may not be possible (Bonner et al. n.d.)
5. Technology of latrine – pit, VIP, pour flush, full flush
6. Scope of accessibility elements included – not consistent
7. “Materials cost” does not equate to the cost of construction as it fails to include for value added resulting from labour and plant costs and temporary works. It also omits a contractor's overheads and risks which contribute to the total cost
8. “% additional cost” was typically calculated as a function of the whole latrine facility, but the WaterAid assessment and maybe in some of Metts' case studies it was based on the “original” cost i.e. not including the accessibility elements.

Therefore the assessment of “extra cost” is affected by a whole variety of issues which invalidate any simple comparison. Some of these problems are identified by WB as reasons why other cost assessments are not valid (Steinfeld 2005). They note that some costs such as larger cubicles are unavoidable but do not recognise that for pit latrines; since most pit walls align with cubicle walls; pits will also be larger and therefore last longer than a standard cubicle.

2.11.4. Units of comparison

From these three studies it becomes clear that the lack of a consistent form of comparison (2.11.3 bullet 8 above) is a particular problem. However construction industries around the world already use standard units of comparison:

- The cost per m² of usable floor space (Bonner et al n.d:B3, Theunynck 2002:9)
- The cost of a single unit (e.g. classroom) (Leathes, B. 2009:9, Bonner et al n.d:B2)

Both enable better comparison of estimates arising from differing facility sizes, e.g. a 2 cubicle block or a 16 cubicle block. However, it could be argued that the latter method is more useful as it enables

comparison to equivalent sanitation provision for 20 girls or 25 boys.

There is an argument though that where accessible cubicles are not open for use by non-disabled students then they are not actually providing sanitation for 20 or 25 students, reinforcing the idea that accessible cubicles should be open to all students.

In either case, either of these two units provide a better basis for comparison than the “extra/ total cost” of a facility.

2.11.5. Whole Life Costs

In all the literature reviewed of “extra cost” only the construction costs, or even only the materials costs, were estimated. None assessed costs in the context of the project, i.e. including planning, design, logistics, management or in light of the whole life cost (WLC) of the facility i.e. including cleaning, routine and periodic maintenance, emptying or refurbishment. The failure to assess WLCs of water and sanitation projects is noted by other sources (Leathes 2009, IRC 2010a, WELL 2006) and very little data exists on either of these timeframes, i.e. the project or the design life of the school, although failure to budget for these activities is more likely to result in misused or damaged facilities which require major refurbishment or total replacement.

A 1999 USAID study of single classroom community schools in Mali identified the “start-up” costs, i.e. project development and construction, to be 13-19% of the annual school costs. If the construction cost alone is expressed as a percentage of the annual school costs, this reduces to 8-17% (Tietjen 1999:60) A similar 2002 WB study estimated the annualised cost of construction to be 38% of the recurrent school operational costs, based on a 25 year lifespan (Theunynck 2002:4). However a 2009 report for DFID found average annualised construction costs at 5.7% of the recurrent costs for schools in Africa (Leathes 2009:9)

Although these assessments vary greatly even though they are all for schools in LICs, it is clear that the capital cost is but a fraction of the WLC and as such the “extra construction cost of accessibility” will be a further fraction of the WLC.

In conclusion, as noted in a 2005 WB EFA report, *“cost is not a significant barrier to accessible design although it is often perceived to be one...Estimates of costs developed by those with limited knowledge of accessible design often overstate the actual cost and ignore the savings...when there are clear benefits for all users, controversies about cost will give way to creating problem solving and providing the best environment for learning possible.”* (Steinfeld 2005:3)

3. Methodology

3.1. General

In light of the literature reviewed in Section 2, Section 3 outlines the reasons for using both quantitative and qualitative data in this study. It explains the methodology used to collect and analyse the different data sets relating to physical accessibility, condition of sanitation facilities, attitudes and perceptions on disability and inclusive education. It identifies the documents to be collected on which institutional assessment and cost analysis will be based.

3.2. Goal and Objectives

As noted in Section 1, the Goal of this study is to **understand the role of accessible sanitation in facilitating inclusive primary education in Tanzania**. The objectives are:

1. Assess the benefits of both 'accessibility features' and 'good practice watsan' features of school sanitation for students with different impairments
2. Identify the significance of inaccessibility as a barrier to disabled children's enrolment, attendance, attainment and completion in inclusive primary education.
3. Understand the institutional environment in relation to provision of accessible sanitation in primary schools
4. Estimate the construction costs of accessible sanitation in relation to costs of school sanitation construction.

3.3. Background to selection of scope and location of study

The finalisation of the research scope and location were primarily based on the availability of support offered to the researcher following extensive correspondence with various parties. From the literature review and based on the Supervisor's previous involvement with WaterAid it was clear that they are one of the more active stakeholders on this topic. In response to an outline methodology note, the Wateraid UK office suggested their Tanzania country programme as a suitable location for the field research. The researcher then investigated the specifics of Tanzanian policy and ongoing activities relating to inclusive education and school sanitation to confirm suitability and in order to develop the methodology note for discussion with the WaterAid Tanzania Advocacy Office.

The fact that a school WASH mapping exercise had been conducted in 2010 assured the researcher that the topic was of current interest, and the involvement of UNICEF, CCBRT and SNV in the development and piloting of the NG SWASH confirmed there would be awareness and interest in the research activities and final output.

The selection of Tanzania was also aided by the fact that English is the most common European language spoken and that travel time, cost and visa requirements were not excessive.

3.4. Rationale for approaches used

Both quantitative and qualitative methods were used during this research.

3.4.1. Quantitative

In line with the methods identified in the literature review, quantitative analysis methods were used to establish the extra cost of inclusive sanitation as well as the educational enrolment and

attainment of disabled children. Spatial and definitive data in the form of construction drawings, supplemented by photographs were collected to ascertain levels of accessibility and presence of good practice water and sanitation features

3.4.1.1. Estimating costs of construction

Where relevant Bills of Quantities (BoQs) were not available construction drawings were the basis of material take-offs by the researcher. Assumptions about construction methods and BoQ rates were based on documents collected during the field research period, interviews with engineering personnel or recognised standards.

3.4.1.2. Defining and assessing “extra cost of accessibility”

As noted in Section 2.11.1 of the literature review there is little existing research on the extra costs of inclusive sanitation and the methods used are not clearly defined, vary greatly and not comparable. Therefore the researcher has considered these methods and also used personal judgement and experience to finalise the method used in this study.

3.4.1.3. Project and Whole Life Costs

Although it is clear that construction costs are only part of the full cost of any infrastructure project (2.11.5), the researcher anticipated great difficulty in collecting other cost data, therefore relevant questions were also included in the interview tools. However no useful information resulted.

3.4.2. Qualitative

The use of enrolment, attendance and attainment figures would have been ideal to assess whether accessible sanitation is beneficial to disabled students. However the literature review clearly identifies lack of good quality education statistics as a barrier to assessing benefits and particularly disaggregated data on disabled students (2.2 + 2.7.2). Therefore qualitative methods were used to analyse the attitudes and perceptions of disabled children, education officials and other informants on inclusive education and accessible sanitation.

The nature of the institutional environment in relation to provision of inclusive sanitation is identified from document review and key informant interviews.

3.5. Data Collection Methods

A number of basic methods were used:

1. Accessibility Audit Tool
2. Unstructured and semi structured interviews, including focus groups
3. Structured and unstructured observation
4. A form of ‘pocket chart voting’ and ‘ranking’
5. Document review and secondary data

3.5.1. Accessibility Audit

As outlined in 2.10.2 the tools used in research assessing accessibility have developed over time and the majority are based in first world contexts, not always identifying what compliance criteria have been met or the effectiveness of the features for disabled users.

Checklists for assessment of school WASH are included in the NG SWASH Toolkit 1: Assessment and Monitoring, but does not particularly assess accessibility.

The Accessibility Audit (AA) approach developed by WEDC was the basis for the AA tool used in this study, applying relevant compliance criteria noted from NG SWASH. For some features the NG SWASH had conflicting criteria, such as for the width of corridors or the size of accessible cubicles.

An element of judgement was therefore applied which is explained in 3.8.

Prior to the field research period the researcher had no knowledge of the SEDP Technical Handbook (URT MoEVT 2004) or the BEST-AC advocacy fact sheets (CHAWATA 2008) which have been developed in the Tanzanian context and therefore these were not referred to when defining compliance criteria.

3.5.1.1. Selection of facility audited

Where more than one toilet block existed at a school the AA was conducted on the facilities used by disabled children. Where separate boys and girls facilities were both used by disabled children, only one was audited. At boarding schools, the 'daytime' facilities were audited rather than hostel facilities.

3.5.1.2. Accessibility Audit tool

The tool for the AA was a form which required measurements or other entries to be made in respect of particular features of accessibility, sanitation and water. Space was provided for sketches and additional information (Appendix 8.4).

In addition to measurements, y/n or numerical scores were recorded in response to statements, e.g. ramp present. Whereas measurement and presence of features are objective, whether a tap can be opened is a subjective question requiring understanding and knowledge of disability by the researcher.

Good practice water and sanitation features

In addition to 'accessibility features', good practice water and sanitation features were also recorded, such as washable slabs. Although these do not affect accessibility, these features are particularly important for disabled children since they influence cleanliness and hygiene conditions of facilities.

3.5.1.3. Measurement equipment

Tape measure

A tape was used to measure widths, heights, lengths etc of structures and fittings, including seats.

Spirit level, string line and folding rule

To determine the slope of gradient of ramps, it was necessary to measure the horizontal and vertical dimensions of the ramp (Fig 3.1). Since the adjacent ground cannot be assumed to be horizontal, a string line, spirit level and folding rule were used.

Figure 3-1: Measuring ramp slope



Figure 3-2: Electronic lux meter



Electronic equipment

The decision to use the light meter was based on a need to use a method that allowed comparison of readings, although it is acknowledged that such equipment is not always readily available. (Fig 3.2)

A small camera was used to supplement measurements, sketches and construction drawings.

3.5.2. Interview ws

Knowledge, attitudes and perceptions were based on interviews held with disabled students and school personnel as well as through observation. The majority of staff were teachers, but also medical and school management personnel.

Semi structured interviews conducted with staff were either individually or in pairs. Interviews with parents were based on the same format as the teacher's interview, but without questions relating to teaching qualifications or experience of teaching disabled children.

Interviews with students were loosely structured and varied greatly depending on disability type and age of the students. The nature and extent of their disability was noted as well as basic data about gender, age and class. Student interviews were conducted individually or in groups.

Unstructured interviews were conducted with key informants due to the varying specialism of each individual, either in person, using Skype or email correspondence both in Tanzania and UK.

3.5.2.1. Interview Tools

Eleven separate interview prompt tools were developed before the field research period the researcher selected from this menu of topics as appropriate to the school interviewee. (Appendix 8.4)

- | | |
|--|-------------------------------------|
| 1. Introduction to the researcher and research | 7. Attitudes to inclusive education |
| 2. Officials – basic data | 8. Funding for school latrines |
| 3. School demographics | 9. Home latrines |
| 4. Disabled child's individual details | 10. School teacher – basic data |
| 5. Accessibility Audit | 11. Management of school latrines |
| 6. Knowledge and attitudes to disability | |

To try and enable comparison with NDS and BEST data, the different disability categories used by each of these reports was replicated on interview tool 4. This tool was found to be the least useful in the field since often the interviewer, interviewee or attending adult had little understanding of the various medical conditions and disabilities used in the NDS.

Similarly, extracts for the SWASH mapping checklist were included on Tool 5 to compare with SWASH scores of schools mapped in 2010. In practice Sheets 8 and 9 were never used as no interviewee reported having sanitation adaptations at home and data on infrastructure funding was generally recorded on Sheet 11.

3.5.2.2. Focus Groups

No formal focus group discussions were planned but in actuality many interviews with disabled children occurred in groups since students had been 'called' by the school authorities to attend. To avoid students feeling stigmatised or inconvenienced, these interviews were conducted in groups. However these could not be classified as 'discussions' as the students behaved as if they were in class, shy and usually speaking in turn starting with the eldest with little discussion of views amongst themselves.

The opportunity for another group interview occurred when a seminar being held at one of the schools had a break. The seminar was for visually impaired people and the interviewees were all ex-students of the school.

3.5.2.3. Question order and type

To avoid leading or prompting interviewees' responses, interviews began with general open questions about knowledge and attitudes to disability or regulations before moving onto attitudes and perceptions of inclusive education and finally the role of accessible sanitation. Therefore data on other barriers to inclusive education were captured. No closed ranking or preference questions were used with adults.

3.5.2.4. Data on barriers to inclusive education

Of key interest was the issue of 'refused admission' reported in the NDS (2.7.2.1). Therefore the researcher included questions to school authorities on this subject within the semi-structured interviews as well as questions about enforcement and consequences for failing to enrol children in school.

3.5.3. Observa tion

Prompts for observation of sanitation and water facilities were included on the AA form. Other observations of behaviour and facilities were noted on the relevant interview forms.

3.5.4. Pocket Chart voting and ranking

An ad hoc pocket chart voting/ ranking exercise was used to identify disabled student's preferences for school sanitation improvements. 8 sanitation improvement options were written in Swahili on separate pieces of paper and the children asked to select their two top preferences out of sight of their peers.

3.5.5. Document Review

During the literature review it became apparent that a number of documents were not available online or in soft copy and field document collection also took place.

These include reports and data from DPOs, particularly CCBRT, a partner of the SWASH programme with WaterAid Tz, SNV Tz and UNICEF as well as numerous government policies and regulations.

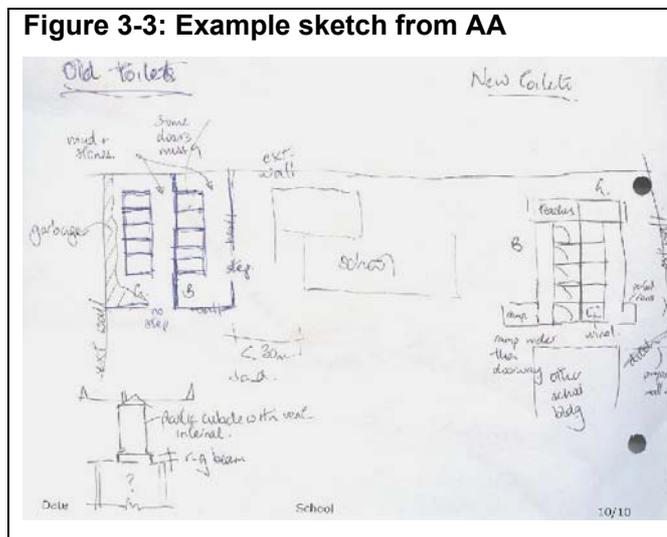
To identify and locate relevant information relating to cost estimation and accessibility regulations the researcher attended the offices of a number of professional bodies in Dar es Salaam (Uriyo 2011) as well as the QS department at Ardhi University (Kikwasi 2011, Mdemu 2011). Similar efforts were required to get copies of the standard latrine drawings from the MoEVT Infrastructure Department, although the researcher was unsuccessful in acquiring the respective BoQs and specifications.

Due to the recentness of the NG SWASH, the researcher had not expected it possible to measure the impact of accessible sanitation on rates of primary school enrolment, attendance of completion. Even if this data had been available, it would not have been possible to link any trends directly to latrine provision, and certainly not to accessible latrine provision due to the huge number of variables at play.

In the absence of disaggregated data on the attendance and attainment of disabled students URT statistics of enrolment form the basis for assessment of educational benefits.

3.5.6. Data recording

AA and interview data were recorded as handwritten notes or sketches. (Fig 3.3). This was supplemented with photographs as appropriate and any documents collected. Video clips were also taken to remind the researcher of the distances, ground conditions and layout between school buildings and the latrines. The day's data were collated each evening and any gaps or illegible handwriting corrected.



Due to the language issue, recording of interviews was not appropriate for this research. Intensive observation of toilet use was also not considered likely to yield useful results due to the effect the researcher's presence would have on behaviour.

3.6. Triangulation

3.6.1. Physical data

The use of AAs verified construction drawings and responses from disabled children and staff about the physical nature and condition of school sanitation. Since many schools were visited during exam time or school holidays, to verify whether the 'normal state' of facilities would be different, questions were asked of school staff and students, e.g. cleanliness. Similarly questions on water supply functionality i.e. pressure and continuity of flow, relied on information from school staff. Information from key informants and document review also provided supporting or contrary data. Photographs and sketches provided supporting records for ethnographic content analysis.

3.6.2. Knowledge, attitudes and behaviour

Body language, tone, choice of vocabulary as well as contradicting responses and observed behaviour were used to confirm the veracity of oral responses cognisant of the fact that students may be uncertain or uncomfortable responding to the interviewer's questions. Contradictions between informants also occurred. Observation of student behaviour was used to verify responses, but though able bodied students were observed, no disabled student was directly observed using latrine facilities due to the reasons explained in 3.5.6 and 3.13.1.

3.7. Sampling

3.7.1. Sample size

This is a social research study and was not intended to be rigorously statistically robust. Therefore it was not designed as a purely quantitative study although quantitative data was collected. As a result, the issue of sample size was not a critical factor during the research design.

Tanzania is a huge country and it was not viable to sample purely randomly due to time and cost constraints. Therefore a combination of purposive, opportunistic and random sampling occurred with the primary aim of visiting those mainstream schools where disabled children attended, balanced by targeting some special and secondary schools.

3.7.2. Selection of key informants

Due to their various roles in the education, sanitation or disability sectors, key informants were typically selected based on prior correspondence or contacts. For these reasons responses from key informants are unlikely to represent the general views and understandings of Tanzanians since they are sanitation, education or disability professionals.

3.7.3. Selection of schools audited

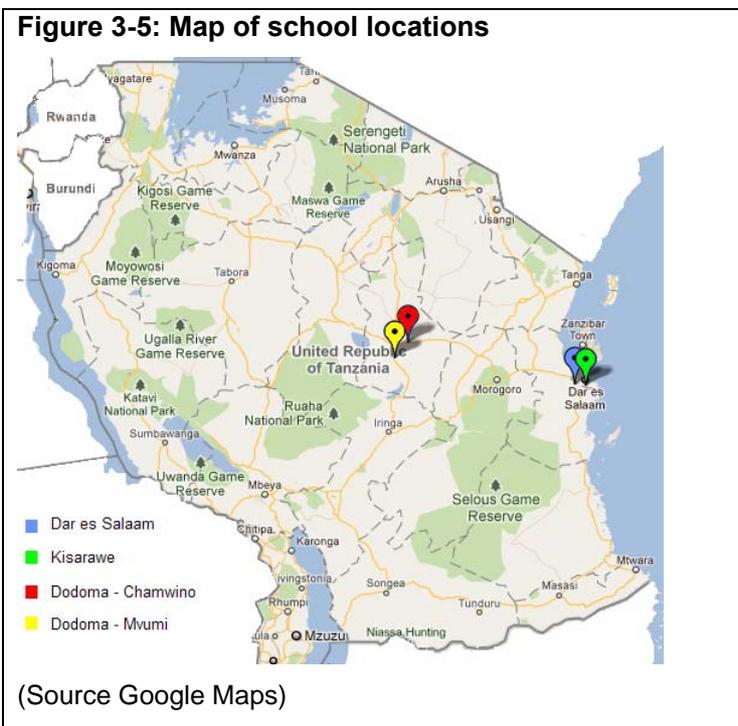
In all, 17 toilet blocks were accessibility audited, of which one was at CCBRT and the other an inclusive secondary school. In addition to the 28 disabled children who were currently in primary school, interviews were conducted with two disabled children who had completed PS, one who had dropped out and two disabled children in Secondary School. More than 10 key informant interviews were conducted but only some of the data feeds directly to the study findings whilst other information facilitated the research process (Fig 3.4 and Appendix 8.2).

Figure 3-4: summary of schools and informants visited

Schools					Disabled children (Some multiple impairment)					Adults								
Inclusive	Integrated	Special	rural	urban	Boys	Girls	physical	visual	Hearing/ speaking	intellectual	School staff			Key Informants				
											Inclusive	Integrated	Special	rural	urban	Education	Medical	Watsan
11	1	4	8	8	15	13	17	9	1	5	19	3	7	15	14	5	2	4

In all cases the selection of institutions visited was constrained by distance to minimise travel and maximise time available for interviews, observation and accessibility audits. (Figure 3-5: Map of school locations)

The decision to visit schools in Dar es Salaam was based on it being the location of the international airport as well as WaterAid, CCBRT, UNICEF and SNV offices. Dar es Salaam schools visited were primarily those where CCBRT provided support plus two special schools which were of interest to CCBRT.



A further visit to a WaterAid supported school meant that schools in all three Dar es Salaam municipalities were visited.

In Dodoma region, the selection of Chamwino Municipality was due to it having the most 2010 SWASH mapped schools recorded as having latrines suitable for disabled children. Final school selection was based on the experience of the Municipal Special Education Coordinator having explained the purpose of the research.

3.7.3.1. Selection of School representatives met

In most cases the representatives met were head teachers or assistant head teachers with whom the visit had been arranged. In some cases, the research team was handed over to other staff, be they teachers, rehabilitation or management personnel.

Although the researcher had not targeted any particular staff, it is clear that the size and attitude of the school towards the visit played a role in determining who took part in the interviews.

3.7.3.2. Selection of disabled children met

Selection of disabled children interviewed was decided by the teachers met. No criteria were given, just that the researcher wished to interview any disabled children enrolled at the school.

3.7.4. Odd one out

Plan Tanzania are the first agency to have included accessibility into their sanitation programmes and the researcher was keen to record details of their facilities which would have been in use for some time. However due to distance, it was not possible to visit a school where a disabled child was enrolled. Therefore, following a visit to another Plan supported school, the researcher requested the accompanying Plan project officer to conduct an interview with a known disabled child at a different school with the same latrine design, should her schedule allow. The resulting interview responses and accompanying photographs were received by email (School S8 and child JN).

3.8. Defining compliance criteria

3.8.1. Why?

As outlined in Section 2.9.5, it is clear that when assessing accessibility, despite best intentions, implementation can render accessibility features redundant. Therefore the criteria which define compliance and effectiveness are important

3.8.2. Compliance levels

The full criteria can be found in Appendix 8.3

3.8.2.1. Logic for defining criteria

It was necessary to develop 'minimum criteria' for different types of features, which if not met, would not be recorded as being 'compliant'. These criteria were based primarily on two sources:

- URT MoHSW (2010) *Draft NG SWASH, Toolkit No. 2*
- Jones and Reed (2005) *Water and Sanitation for Disabled People and Other Vulnerable Groups: Designing services to improve accessibility*

Reference was also made to other accessibility guidelines found during the literature review (2.10.2).

For some features the NG SWASH had conflicting criteria. An element of judgement was therefore applied and usually erred on the side of caution, i.e. larger dimensions or gentler slopes. However, the researcher doubted that many facilities would meet the most stringent compliance criteria and therefore the AA also noted compliance against any lesser criteria.

3.8.3. Triangulation

To verify the researcher's compliance criteria, observations were made during the field research. For example recording the plan dimensions and turning circles for some of the different wheelchair designs observed in order to check the relevance of cubicle size criteria.

3.8.4. Identifying critical accessibility features

3.8.4.1. Rationale

The research attempted to identify which features were critical to accessibility for two main reasons:

- To identify those features which most benefit particular disability types for situations where particular groups are being accommodated e.g. special schools for the visually impaired.
- Acknowledging that school budgets may not extend to the full range of accessibility features, and for practical reasons, planners may wish to prioritise the most critical features

3.8.4.2. Retrospective costs and effort

However, since some features cannot be added retrospectively as outlined in 2.10.4 or would be more costly to add (2.11.1) it is particularly important that they are considered early (Jones 2011). This is particularly relevant in light of the numerous existing school latrines which are not accessible.

3.9. Assessing Costs

“Cost figures can be messy. Definitive bottom line numbers are chimeric, and completely accurate calculations of cost generally elude the researcher. The figures in this report are no different. The reader is cautioned that the amounts presented here are inexact” (Tietjen 1999 p15)

3.9.1. Rationale

The demand for greater financial accountability, particularly in the current economic climate is one of the reasons for researching the cost of accessible sanitation. The other is the fundamental need for data to estimate budgets for accessible sanitation programmes.

3.9.2. Construction cost data

The methods identified in the literature review relied on Bills of Quantities (BoQs), but the quality, detail and scope of these analyses varied greatly as did the interpretation of the data.

The intended methodology of this research was to use priced BoQ from actual constructed latrines however in many cases, although called BoQs, the documents collected provided only quantities of materials (a materials take-off) and materials prices. As outlined in 2.11.3 this method does not represent the cost of construction as explained in more detail in Box 3.1.

Box: 3.1: The difference between “value” and “cost”

There is a distinct difference between “priced BoQs” and a “priced materials take-off” which can be conceptualised as the difference between “value” and “cost”.

Taking-off materials is the process of calculating the quantity of the different types of materials required to complete the permanent works based on construction drawings. Concrete and masonry may be broken down into their constituent materials; bricks, cement, sand, water & gravel.

However the cost of materials alone does not equal the cost of providing the completed structure as it does not include for labour, plant or temporary materials.

By comparison BoQ rates include for both labour and plant, but should also include risk, administration and overhead costs (e.g. supervisors or safety equipment). More importantly, BoQ items also include for temporary works, i.e. those works (labour, plant and materials) required to undertake the permanent works, e.g. access equipment, formwork (CRB n.d).

Standard methods of measurement of BoQ quantities are used in different countries which clearly define the “BoQ work item coverage” or scope. In Tanzania the “Standard Method of Measurement of Building works for East Africa” is the applicable document (Architectural Association of Kenya

1970).

Therefore estimates based on BoQ rates assess the “value” of the works, i.e. including labour, plant, materials, risk and overheads whilst take-offs can only produce materials “costs”.

Other BoQs collected were of insufficient detail or had been priced as lump sums making it impossible to differentiate between standard and accessibility items.

Therefore the researcher developed some cost data from first principles and this section contains a certain amount of detail assuming that the reader may not have experience of standard methods of cost estimating.

3.9.3. Documents to be collected

The original methodology required the following documents:

- Bills of Quantities, priced Bills of Quantities
- Bid/ actual schedules of rates
- Take Off sheets, records of variations
- Construction drawings, photographs
- National construction price indices
- National schedule of rates

However, in response to the difficulties in collecting some of these documents other related information was collected to enable Objective 4 to be achieved:

- Rate build up data providing data on standard assumptions in Tanzanian context
- National school latrine standard drawings, technical specifications and BoQs
- National method of measurement - Standard Method of Measurement of Building Works for East Africa (Architectural Association of Kenya 1970)
- CRB training notes on ‘Principles on Construction Cost Estimating’

3.9.3.1. National data

Construction or Consumer Price Indices are typically produced by national agencies and the researcher’s original methodology anticipated for the inclusion of inflation and market effects in the cost estimating process. Similarly it is standard practice to acknowledge that rates vary depending on the locality, accounting for transportation charges and availability/ scarcity

No data was located during the literature review period and so the researcher had hoped that national data would be located during the field research period. However this was unsuccessful and was therefore not included in the assessment of costs.

3.9.3.2. National schedule of rates

Governments often publish national schedules of rates which are used to develop cost estimates for public sector works against which contractor’s bids are assessed. Hence this information would have assisted the researcher to verify rates to be used in the cost estimates.

The NBS website advertises a national schedule of rates for materials for 2002, but it had not been possible to contact them from the UK. Therefore this was one of the specific documents sought during the field research but the researcher was advised that the Tanzanian construction sector did not use it as it was inconsistently published and the industry lacked confidence in it (Uriyo 2011, Kikwasi 2011).

3.9.3.3. Agency costs databases

In order to triangulate any national data, cost data from relevant stakeholders was also sought from buying departments who often maintain databases of common materials for internal use. A spreadsheet of Rural Water Supply and Sanitation Unit Rates was acquired from one of the

WaterAid engineers (WaterAid Tanzania Petro)

3.9.3.4. Labor, plant and overheads estimation

As the intention was to use BoQ rates which include for labour and plant required to do the work, it was not necessary to estimate for these separately. However, as noted in 2.11.3 it is not possible to assess the costs of overheads such as supervision staff or vehicles. It has to be assumed that BoQ rates from the various data sources include some mark up for these elements.

3.9.4. Validity of method

As stated in 3.4.1.1 the researcher undertook cost estimates from first principles. Assumptions about constituent materials and temporary works were based on standard methods and interviews with engineering personnel including CRB (Uriyo 2011), Ardhi University lecturer in Quantity Surveying (Kikwasi 2011), Ardhi University Quantity Surveying graduate (Mdemu 2011) and engineers from Plan Tanzania (Mtitu 2011) and WaterAid (Petro 2011.).

BoQ rates used for the cost estimate were derived from 6 sources, all which were either recent or ongoing works (appendix 8.6):

- NG SWASH Toolkit 2:2 Annex I (URT MoHSW 2010)
- CRB training materials (Contractors Registration Board n.d.)
- CCBRT contractor's BoQs for new accessible school latrines (NTK's Investment 2011)
- EEPKO BoQ for new accessible school latrines (EEPKO 2011)
- WaterAid Unit Rate spreadsheet (Petro 2011)
- BoQ for Mkwawa school latrine (Kinondoni Municipality 2011) assumed to have been created by the Kinondoni Municipal Engineer

3.9.4.1. Accuracy of calculations

The AA sketches and photographs from the field visits were used to verify dimensions and layouts on construction drawings.

To check the accuracy of the materials estimates some of the take-offs were checked independently by an undergraduate Quantity Surveyor. It was not possible cross check the materials take-offs against the information provided in NG SWASH Toolkit No.2 Part 2 Annexes A, B and C since the NG SWASH "BoQs" are part BoQ, part materials quantities and are not detailed enough to identify accessibility components.

3.9.5. Operation & Maintenance Costs

As noted in 3.4.1.3, school staff and education officials were asked about frequency and costs of latrine cleaning and pit emptying as part of the semi-structured interviews. Local authority officials were also asked this during interviews but very little information was forthcoming.

3.9.6. Extra costs of accessibility

As noted in Section 2.11, previous attempts to assess cost have all used varying methods, some of which appeared to the researcher not to fully estimate the cost of construction, or satisfactorily define the "extra cost of accessibility".

3.9.6.1. Defining extra construction cost of accessibility

The methods used in the literature reviewed studies produced data that is not readily comparable with other facilities, since the cost of the whole facility is greatly dependant on the standard of construction as well as the size of the whole facility. i.e. an accessible cubicle in a 2 cubicle block

will obviously represent a greater proportion of the overall cost than an accessible cubicle in a 6 cubicle student latrine block.

It was therefore important to the researcher to identify a method of assessing extra cost that could be replicated and be useful regardless of the size of the overall facility. Hence although this study calculated the “cost of accessibility features” as a percentage of the “total cost of the latrine block”; the literature review method; it also calculates the cost/cubicle and cost/ m² as explained in 2.11.4. This required construction costs to be estimated to a high level of detail to segregate the costs of the “accessibility components” in comparison to the “standard components”. However, as stated at the beginning of the Section, this level of detail is not necessarily conducive with the nature of the exercise since assumptions need to be made at all stages of the calculations.

- “Standard components” are defined as any works that would normally be included to provide a non-accessible latrine block.
- “Accessible components” are defined as any additional works required to make the latrine block accessible.

For clarification a visual of these definitions can be found in Appendix 8.5.

3.10. Data analysis methods

3.10.1. Quantitative analysis

Accessibility, sanitation and water features were assessed on presence and compliance. Interviews with disabled children are the main basis for determining impact of these features on students with observation of behaviour and of the facilities’ condition used for triangulation.

Collation of data in spreadsheets enabled assessment of prevalence, compliance with criteria, and development of basic statistics such as totals, percentages, ranges, medians and means.

Analysis of costs was also done using a spreadsheet.

3.10.2. Coding

Few interviews at schools were conducted solely in English which means that the translator’s understanding and attitudes to disability, inclusive education and sanitation cannot be easily separated from the views of respondents. Interviews with key informants were held solely in English, but again whether interviewees had exactly the same understanding of the questions as the interviewer cannot be guaranteed due to different social and cultural backgrounds as well as differing knowledge and experience of disability and sanitation. Therefore the vocabulary recorded from the interviews is biased towards the vocabulary which both the researcher and translator would naturally use.

Ethnographic content analysis (Bryman 2004:180,185) of qualitative data identified emerging themes under a range of issues such as barriers to education or difficulties using school latrines. These were collated to enable identification of frequency of occurrence and sorting by rural/ urban, boys/ girls, inclusive/ special school etc to identify trends in responses.

3.11. Field Research Timetable

The window for the field research was constrained by the researcher’s prior MSc obligations and the Tanzanian school summer holidays (Appendix 8.1).

Four weeks were scheduled including time allocated at the beginning and end of the visit to brief

and debrief research supporters WaterAid and CCBRT.

A draft workplan was developed and discussed with both the IRP supervisor and the WaterAid Tanzania Advocacy Unit, the unit supporting the researcher with MoEVT clearance (Appendix 8.9) and logistics. Further correspondence was had with CCBRT since they would provide support for the first week of school visits around Dar es Salaam.

As anticipated, a number of changes to the draft workplan occurred in the field for various reasons.

3.12. Research effects, ethics and bias

3.12.1. Effects

Various researcher effects were unavoidable and every effort was made to overcome these issues.

- Research Team – number: The research team numbered up to seven people, not including school staff
- Research team – composition: In addition to the researcher, two WaterAid representatives, a MoEVT Special Education representation and a local education authority representative were usually present.
- Researcher - personal attributes. The researcher's age, sex, ethnicity etc could all affect how different informants reacted to interview questions

3.12.2. Ethics

Various literature on social research identify risks due the power relations that exist during social research and the impact on informants. Bryman (Bryman 2004:59) identifies four principles for consideration:

- Where there is harm to participants
- Where there is invasion of privacy
- Where there is lack of informed consent
- Where deception is involved

3.12.3. Bias

3.12.3.1. Technical bias

The researcher is an engineer and, as a result of studying for this MSc, in the specifics of water and sanitation. There is no professional experience of the disability or education sectors. However, personal relationships and volunteering experiences with disabled adults and children in developed and developing country contexts provided the researcher with sufficient interest to study this topic. Hence it is hoped that awareness of the specific needs of disabled persons coupled with the sensitivity to include them in a participatory manner enabled the researcher to overcome any shortfalls in knowledge.

3.12.3.2. Independence

This was the first time the researcher had visited to Tanzania but they have previous experience working in other African countries which provided the basis on which appropriate behaviour and deference to hierarchy was decided.

However, the researcher was also aware that by being a foreigner and short term visitor, some social rules could be stretched. This was helpful when discussing disability and sanitation issues, enabling the researcher to joke and draw attention to her lack of knowledge on Tanzanian cultural norms, whilst asking awkward questions.

3.13. Limitations, gaps and mitigation measures

3.13.1. Time and timing

There were various limitations relating to time:

- Geographical Boundaries: due to travel time and cost
- Interview length: limited development of rapport, leading into sensitive topics
- Schools closed or in exam time: students and teachers unavailable/ busy
- Working days and hours: interviewees unavailable
- End of rainy season – conditions during very dry or very wet weather not observed

The issue of disabled student availability for interviews was identified early since it is raised as a limitation in three previous MSc research projects (Russell 2007, Fawzi 2010, Chambers 2005).

During the design the researcher had hoped that interviews about latrine use would be conducted near the latrines so that theoretical questions could be avoided and direct observation of use could be recorded (WaterAid Mali 2007:2, Jones & Reed 2005:36).

However where schools were closed or preparing for exams it was not convenient to ask disabled students to return to school. Therefore students interviewed were usually at school for class and, in their short break periods, it was difficult for the researcher to take up too much of their time with interviews and which prevented observation of latrine use and constrained how preferences were identified, i.e. open questions rather than ranking of a range of options which many have influenced response. This concern not to influence or prompt children about their preferences has resulted in less data on some accessibility features.

To try and overcome this problem, the 'pocket chart voting/ ranking' tool was introduced (3.5.4) when it appeared that some students were being influenced by the views of others. However some of the younger students could not read the written voting choices and this, coupled with inexperience in the use of features such as flush toilets or ramps, made the exercise less than perfect. Even if photographs could have been prepared in advance, the nature of some of the voting options would have been difficult to depict, e.g. more latrines.

3.13.2. Communication

Many of the constraints associated with communication were anticipated prior to the field research but this did not make them any easier to manage.

- Ex-country communication: time and technology difficulties
- Language- English Swahili: understanding of concepts
- Language – Swahili – Kigogo: understanding of concepts
- Language – no language: unable to ask open questions to speech or intellectually impaired students
- Swahili vocabulary: inferred meanings for particular words or no direct translations
- Translated vocabulary choice: natural preferences of translator and researcher affects vocabulary recorded from interviews
- Social norms: sensitivity of vocabulary and subject matter

3.13.3. Sampling Limitations

The ability to generalise the research results is affected by the purposive selection of schools. This

effect also relates to school staff who will have greater awareness of disability and inclusive education concepts than staff in schools without disabled children. Similar bias from key informants is also likely (3.7.2).

The research only met disabled students and, except for one child, did not collect data from disabled children not in school

3.13.4. Experience limitations

- Interviewer and translator experience: asking open questions, avoid prompting etc
- Interviewee experience: awareness of concepts being discussed, ability to respond to theoretical questions about preference

3.13.5. Document gaps

In addition to the gaps in statistical data, documents and information that were not satisfactorily accessed relate to the current legal policy and requirements for accessibility of public buildings and construction regulations. Attempts prior, during and after the field research to identify the relevant documents and to ascertain current requirements for accessibility, if any, failed to fully resolve this aspect of the research with regard to institutional barriers within the social model of disability. As explained in detail in Section 3.9.3, the reliability of cost data is not as robust as would have been liked due to the limited sources and poor quality of primary data.

3.13.6. Other limitations

- Informants feel obliged: acquiescence due to composition or number of research team. Managed by asking people to leave where appropriate
- Lack of disaggregated data: on disability type, age, gender,
- Iterative effects: as researcher gained more knowledge and understanding of topic and Tanzania, as translator became more aware of disability and sanitation issues

3.13.7. Mitigation measures

3.13.7.1. Informed of purpose

The researcher introduced themselves and explained the purpose of the research to all informants at the outset of any interview or correspondence. However, the researcher cannot be 100% certain that the information provided was complete when translated to interviewees.

Field visits interviewees were informed that the research was not associated with any aid or development programme and that although the data may be used by WaterAid in the future was no guarantee that the particular institution being visited would benefit.

Despite this some school personnel misunderstood the purpose and remit of the researcher and requested assistance on behalf of the school. No requests for personal gain were made.

3.13.7.2. Permission

Permission to interview or take any photographs was asked of the lead school representative present during each visit and individuals where appropriate.

Participants were given the opportunity not to take part or not to answer any questions. However no interviewee declined to partake, probably affected by the relative power of those asking them, e.g. teachers. Instead, the researcher had to gauge their level of comfort from body language and tone to decide whether or not to continue down any particular line of discussion.

3.13.7.3. Anonymity and confidentiality

As some of the opinions expressed were not positive about other agencies, the names of schools, staff and students have been made anonymous although school interviewee requested this. Some of email correspondents requested that they not be identified as the source of specific documents.

3.13.7.4. Working with children and disabled children

The topic of this research meant that it was necessary to work in environments where children are present. Therefore it was important for the research team to dress, behave and speak appropriately. When interviewing children, efforts were made to minimise the number of adults present, although at least one was usually necessary for translation.

Children were asked whether they would be more comfortable with or without school staff present, acknowledging that whilst some may be uncomfortable to speak freely with their teachers present, others may be uncomfortable speaking to total strangers. The researcher presumed that the presence of teachers would discourage students from discussing negative experiences occurring at school.

Attempts were also made to reduce singling out children with disability in front of their peers however this was difficult to control since most visits were planned in advance and schools had already identified and called disabled children to be interviewed.

Adult males were usually asked to absent themselves when girls were being interviewed.

3.13.7.5. Sensitive subjects-disability and sanitation

Discussion of attitudes to disability and toilet use are sensitive subjects (Horne & Debeaudrap 2007). Time limitations constrained the extent of introductions, explanation and gentle lead in questions that could be employed.

For both adults and children, societal attitudes to disability were borne in mind when framing the discussion since it is generally considered 'shameful' to have a disabled member in Tanzanian families.

Where children were old enough to ask, the nature of their disability was enquired about rather than relying on teachers or observation. It was important to the researcher to treat all disabled children as autonomous individuals, to build rapport but also influence the attitude of intermediaries and therefore the language and mood during translation.

When asking school staff about attitudes to disability it was important not to influence their answers, since they might be aware of the government's inclusive education policies and may not be comfortable to question their implementation.

Similar sensitivity was required when enquiring about toilet use. It was important to understand the real reasons that students did not use school toilets, had poor attendance or attainment. Hygiene behaviour questions were framed carefully to avoid students providing 'correct' answers about cleansing practices.

Where schools were either in session, or the toilets either unclean or some distance away, it was not always possible to ask students to demonstrate how they accessed and used the facilities.

3.14. Reliability and Transferability

3.14.1. Accessibility audits

The reliability of the data collected during accessibility audits is very high. Dimensions were

measured and did not rely on construction drawings. Although not physically measured the distance of latrines to school buildings was either estimated by sight or “paced out”.

The measured gradients of ramps are the only data with lower reliability due to the method used.

The degree of error is unlikely to affect the identification of a ramp as compliant or not.

“Smelliness” or “presence of flies” scores may be difficult to replicate, though the researcher usually asked the opinion of all the team members before recording a score.

3.14.1.1. Light measurements

Light measurements, although taken with the same lux meter, will be affected by ambient external light levels, i.e. on a cloudy day, the light levels inside and out will both be affected. However, since latrines need to be accessible regardless of the weather or presence of foliage, the relative external lux levels were not considered during analysis.

However it is not very likely that future SWASH assessors will have access to such equipment.

3.14.1.2. Reliability of interviewee responses

3.5.2 and 3.13.7 note a number of effects that could affect the reliability of responses and the methods used by the researcher to limit these as much as possible. However in such a short time it is not realistic to expect that any degree of rapport with interviewees could be developed and hence there is limited certainty that they would have been totally candid on such sensitive subjects. Yet the researcher feels that the impact is likely to have been reflected in understatement of sanitation problems faced rather than false statements.

The same assurance cannot be given of responses on issues of government policy or practice where public officials were present during interviews.

3.14.2. Question order

In almost all cases interviews began with basic questions about informants, school demographics, understanding and attitudes to disability. The issue of school sanitation was not raised until after attitudes and barriers to inclusive education had been covered and before undertaking accessibility audits. Therefore informants should not have had the specific issues of sanitation or physical accessibility highlighted to them until the end of the interviews and so should have not have been influenced by the researcher.

In some schools this was not the sequence of events due to the location of schools, teachers and students. In these instances no significant bias towards infrastructure or sanitation was recorded. Where respondents did highlight sanitation accessibility, the researcher asked if they had been influenced by prior activities.

3.14.3. Schools – observed behaviour

Bryman identifies the potential of observing behaviour to validate interview responses (Bryman 2004:160). The opportunities for observing behaviour were limited due to the travel requirements between schools, but also due to the size of the research team as noted in 3.12.1.

Due to the sensitivity and privacy of latrine use it is not clear how any method of observing behaviour could be thought be 100% reliable.

3.14.4. ‘Odd one out’ interview

In addition to the limitations noted above one student interview was not held in person but conducted on the researcher’s behalf by a Plan Tanzania project officer as outlined in Section 3.7.4

The officer had accompanied the researcher during a school visit including an accessibility audit and interview of teachers. If the researcher had felt that this officer did not have a good understanding of the topic being researched the request would not have been made.

A detailed interview form was provided to ensure the relevant questions were asked. However there is no way of knowing how much the student was prompted or pressured into responding to the interview questions. The photos of the student suggest that he was happy to show the officer how he used the facilities, of which he is currently the sole user, since he is smiling and they have been further adapted for his needs. (see Fig 3.6)

Figure 3-6: JN in accessible cubicle



3.14.5. Key informant perceptions

All key informant interviews and correspondence were conducted in English, either face to face, by Skype or by email. Although Skype provides opportunities for triangulation by asking clarification questions or recognising tone of voice, email provides few other indicators about the respondent's true feelings on a subject.

No incentives to participate were provided, but as with all personal communication, the reliability of data has to take into account the experience and interest of the individual in supporting the research.

3.15. Interventions

In some cases, having conducted interviews or observed particular circumstances, the researcher or members of the research team decided to act either as individuals or together to improve the situation.

Some examples include:

- direct action of the WaterAid driver to repair a disabled child's wheelchair
- asking the Ministry's Special Education representative to explain the process of accessing hearing aid support to a parent and head teacher
- advising a head teacher of possible changes to a toilet block under construction to improve access for disabled children
- guiding a head teacher on how to monitor cracks in a toilet superstructure to identify risk of collapse due to pit subsidence

Extracts of the draft NG SWASH or Jones and Reed (2005) Water and Sanitation for Disabled People were shared with interviewees where appropriate.

Plan Tanzania was also informed of the current state of some prefabricated toilets they had installed in 2005 at a primary school in Dar es Salaam. This was in response to information from the head teacher that the school had no idea how to rehabilitate these facilities since all prefabricated components were manufactured outside the country. The head teacher had not asked for this assistance but had stated that these toilets would be abandoned. In light of the extremely high student: latrine ratio the researcher felt that any effort to refurbish these latrines would be worthwhile.

4. Presentation of Findings

Section 4 presents the findings based on the field research.

To preserve anonymity (3.12.3.3) all schools and informants are assigned unique references which can be found in full in Appendix 8.2. To aid analysis sorting of data sources was undertaken:

- S1 was not a school and is generally not referred to in the findings. Schools S2 to S6 were special schools; one a secondary school; and S7 to S17 mainstream schools †. S18 was a school that was not visited by the researcher but the toilets were constructed to the same design and by the same agency as school S16 (3.7.4).
- Therefore for clarity, where frequency of occurrence is stated, the number of schools on which this is based will be stated. Sometime the frequency is out of all schools visited (16), sometimes only the Pre and Primary Schools (15).
- Child respondents and adults are identified by their initials. Where names are not known, the initials N.D have been used. Where duplication of initials occurs, numbering has been assigned, e.g. MB1, MB2.

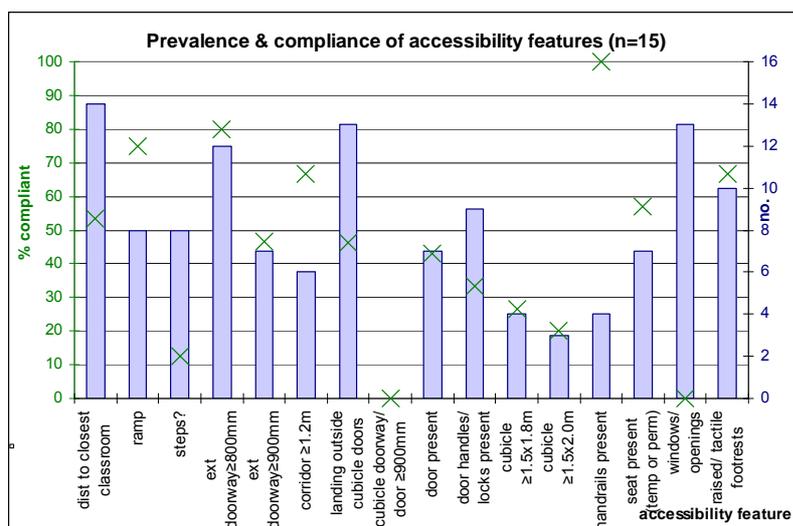
† Since the majority of inclusive schools visited had not been formally registered as inclusive under the appropriate government procedure this study refers to them as “mainstream”.

4.1. Sanitation accessibility in primary schools

None of the schools had what could be called “accessible toilets” that were in use and also fully functioning as per their original design. This compares with the 2010 SWASH mapping survey which recorded 4% of schools having a toilet suitable for disabled children (Geodata Consultants Ltd 2010, UNICEF et al n.d.) but does not note functionality.

4.1.1. Types and compliance of sanitation accessibility features

Figure 4-1: Accessibility features



The columns in Fig 4-1 indicate frequency of occurrence of particular features (right hand axis) and the ‘crosses’ indicate the percentage of those features that met the compliance criteria (left hand axis).

It shows that a range of accessibility features were found but that many failed to provide the intended level of accessibility..

It does not show those features that met the compliance criteria but still failed to provide accessibility due to the overall layout. This issue will be discussed further as relevant for the various types of accessibility, sanitation or water supply feature

4.1.2. Details of assessed sanitation accessibility features

4.1.2.1. Distance and route from classrooms

Distance restrictions to toilets aim to increase convenience and use as well as improving security

and risk of vandalism. Security issues are discussed in 4.2.2.5. 14 out of the 15 PS latrines were within 150m of the nearest classroom, but only 7 were within 150m of the furthest classroom. 8 of the 15 schools routes were assessed as accessible to disabled students.

Rural schools, where latrines were generally further away, had less incidence of incorrect use or open urination than mainstream urban schools, where waste materials were more commonly seen. This may be due to the higher number of users and uncleanliness of urban toilets but also the lack of “cover” for open defecation in rural areas. Very soft or very rocky ground both caused problems for wheelchair users as well as trip hazards for other physically disabled students. The presence of drains and surface water swales across the paths to latrines provided additional barriers.

4.1.2.2. Access at latrines

Ramps

Based on width and gradient all 8 ramps found were compliant. However common sense ruled out two ramps due to doorways which were narrower than ramps or ramps that had been blocked by handrails (Fig 4-2)

School S8 had only 1 ramp which accessed a central classroom veranda. Therefore to reach the latrines a student unable to mount the step would have to travel from their classroom to the ramp location and then along the veranda to reach the toilets, a distance of over 100m.

Steps

The steps criteria specify ranges of height and width, but not consistency of step sizes, i.e. multiple steps should have the same dimensions. 8 out of 15 facilities had steps but only 1 was compliant. Steps were found of varying heights, some over 300mm, which is large even for an able bodied child. Widths of steps were usually within range. The main reason for inclusion of steps is to prevent flooding of latrine pits during the rainy season. Other steps appeared to result from poor planning during construction or included to provide falls for pipes and drainage.

Rocky ground resulting in raised pits was another reason for inclusion of steps. A major problem with steps was their irregularity in height and width, which leads to slips and trips (Fig 4-3). The location of steps within cubicles also formed trip hazards.

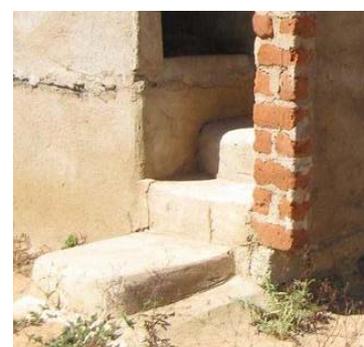
Landings & corridors

Most corridors provided sufficient length outside outward opening doors but some landings and corridors were narrower than the minimum 1.2m criteria. These were only just about negotiable in a wheelchair even with assistance (4.1.3) whilst 1.4m corridors were accessible without assistance. Some concrete corridors suffered from damage and holes (4.4.4), a few of which had been filled with concrete blocks or stones to prevent children falling in, but had then restricted corridor width. Some earth and mud corridors were uneven and their condition during the rainy season can only be guessed at. Many corridors were not self draining, resulting in standing water from rain and from

Figure 4-2: Ramp blocked by handrail



Figure 4-3: Large steps, drop outside first cubicle



cubicles. This was particularly a problem where cubicles were higher than corridors and water could not be swept into dropholes.

Doorways

The criteria for doorways and doors are based on the minimum clear width. NG SWASH notes both 800 and 900mm but observation of child wheelchair users suggests that a 800mm doorway is difficult to negotiate due to their limited strength and shorter reach. 4 out of 15 doorways were wider than 800mm, but none wider than 900mm. Assessment against multiple criteria was explained in 3.8.2.1.

Although School S17 had a double leaf door which would have provided a width greater than 800mm, the bolt to the second leaf was on the inside and therefore not accessible by a wheelchair user (Fig 4-4).

Two urban schools and all but one rural school had no cubicle doors. Of the 7 schools with doors only 3 were compliant. The main reason for non-compliance was doors opening inwards which causes accessibility problems when cubicles are small (Box 5.3). The position of doors was usually to one side of the cubicle which aids access, rather than centrally located.

Figure 4-4: Double leaf door



4.1.2.3. Handles & locks

Observation suggests that the security of external bolts was of greater concern than the ability of children to lock doors during use.

Type

Door handles were mainly the internally sprung type which include an integrated locking mechanism but were often damaged or missing (Fig 4.5)

Most doors did not have handles but used a locking bolt as a method of gripping the door to open it. Therefore these bolts require padlocks to secure them outside school hours

Figure 4-5: Bolt & handles



sprung handle

Size and position

NG SWASH does not provide any guidance on minimum sizes of handles or locks.

Figure 4-6: Small handle+bolt



Figure 4-7: Large internal bolt + handle



Small padlocks might be difficult for a child to hold and unlock. Fig 4-6 shows a small bolt on the inside of the door and though a handle has been provided to aid door closure, this is also small and would be difficult to reach from a wheelchair. By contrast the internal bolt in Fig 4-7 is easy to grip and the handle of the open door can still be reached by wheelchair users having entered the cubicle.

4.1.2.4. Cubicle size

4 out of 15 toilet cubicles were larger than 1.5x1.8m and 3 of these were greater than 1.5x2m. 3 of the 4 large cubicles were found in special schools. Assessment against multiple criteria was explained in 3.8.1.1 The size of cubicles alone cannot determine whether the space has been appropriately used. Seats, handrails or water buckets can restrict access for the physically or visually impaired.

Large cubicles benefitted not just children in wheelchairs but also those needing assistance or using crutches. Supports can be more easily accommodated in large cubicles

Cubicles that are long and thin, allowing only front transfer from a wheelchair, require the user to reverse out.

All large cubicles except one were clean, probably because they were lighter and easier to move about in.

Box 4.1: Establishing the Basis of Design Criteria

Further information on the turning circle of wheelchairs is required before finalisation of cubicle size criteria. Wheelchairs most commonly seen in use by disabled children were 2-wheel wheelchairs with a turning circle of 1.5m




However, some tri-chairs were also seen which required 1.7m turning space. This chair was used by a child with cerebral palsy and it could be argued that the child would always have the assistance of an adult to use the toilet. Other tri-chairs with large front wheels were seen used by adults. The turning circle for such chairs would be significantly greater than 1.7m. Hence the 1.5x2m cubicle size is only suitable for primary schools where adults or older children do not attend, i.e. no disabled teachers or NFE students

4.1.2.5. Handrails

Only 3 schools had handrails present though the S18 photographs showed that a handrail had been added to the standard design (Fig 3-6). All school handrails were wall mounted, both horizontally and vertically. Only S1 had a floor mounted handrail and it had constrained the width of the cubicle (Box 5.1).

Figure 4-8: Wall mounted handrails



Figure 4-9: Loose ramp handrail left, right handrail taken over by laundry



All handrails were circular sections, between 25-75mm diameter and had an average 130mm clearance from the wall. Vertical handrails started 200-470mm from the floor and were 485-600mm in height. Horizontal handrails were fixed between 490-900mm from the floor and were 990-1500mm long (Fig 4-8). Special school toilets had more handrails than toilets of mainstream schools, where not more than one horizontal handrail was ever provided. All handrails were metal,

either bespoke, bent or welded pipe sections some of which had been painted. One handrail had become loose from the wall and no longer provided any support (Fig 4-9). All showed evidence of installation after wall construction

4.1.2.6. Seats

Seats were present in 7 out of 15 PS visited, but only 5 were compliant with the height criteria. The non-compliant seats were either not yet fully constructed or in the pre-school. 4 seats were permanent, 3 being pedestal toilets and 1 seat from plastered blocks. Temporary seats were all chairs, rather than stools and mostly made from plastic or wood (Fig 4-10)

Permanent pedestal seats require sufficient water for flushing and therefore may not always be technically appropriate. Two of the special schools provided a choice of cubicles in the toilet block, 1 squat and 1

Figure 4-10: various seats



Plastic + wooden chairs at pre-school



Wooden chair for adults



Metal mobile bathing chair

pedestal. Of the pedestal toilets, only one had a plastic seat ring in place which reduced the opening size, however the size of the seat openings was not mentioned as a concern by users in contrast to concerns about sizes of dropholes.

None of the removable chairs were in the cubicles visited which raises doubts about actual use and continued dependency of disabled students on others to carry seats to the toilets. The researcher observed that many seats were quite high and questioned whether the problem of splashing had occurred particularly when girls were urinating. No one was able to comment on this. CCBRT confirmed that their trialling of seats had only assessed comfort and not been tested in actual use.

4.1.2.7. Windows and light levels

Only two schools had electric lights and functionality is dependant on intermittent power supplies.

“Framed” windows were only found in urban toilets. Some were screened with mosquito netting which significantly reduced light levels. In both urban and rural toilets gaps between the tops of walls and the roof or created by spaces in blockwork let in light. “Louvre/ vent” precast blocks were seen which may aid privacy but provides little light (Fig 4-11).

The lack of doors at 6 out of the 15 Primary Schools can be assumed to have improved the lighting

Figure 4-11: Various opening styles



situation but conflicts with the need for privacy. (Fig 4-12)

The range of internal lux readings was 2.1-700, with a median of 87. Typical minimum international lux levels for toilets range from 100 to 200.

(International Code Council 2011:53, HSE 1997:28)

Figure 4-12: No doors, still dark?



Girls toilets, no doors, no privacy



Dark (taken at 1600 ISO)

4.1.2.8. Tactile surfaces, colour contrasts and signage

The crenellations on ceramic squat pans were the only tactile surfaces observed but no “purposeful” tactile surfaces were found and disabled students interviewed did not really understand their benefits. No occurrences of colour contrast or disabled signage were found at any school.

Many latrine designs in Tanzania include steps both at the entrance to and within cubicles. These can guide visually impaired users to locate the squat pan however they clearly impede those with mobility difficulties. The general school environment where visually impaired students attended was extremely heterogeneous, requiring students to cope with constantly changing surfaces (Section 4.5). The researcher’s view is that external tactile surfaces for route guidance would be of little benefit in such varying environments.

The international disabled symbol is not commonly found in Tanzania. Though some city public buses exported from Asia have the symbol above doors, it is unclear if passengers are aware of its meaning.

4.1.3. Observation of latrine use

Padlocking of cubicles used by disabled students, be they the teachers’ latrines or accessible cubicles was frequently observed.

The 1m corridor and ramp width at S18 are not easily negotiated by primary school children in wheelchairs even with assistance (Fig 4-13).

A number of cubicles had large stones or concrete blocks placed in front of the drophole. Teachers did not give clear reasons for their purpose. The researcher could see that these would prevent a child from walking straight into and using the cubicle. Instead they would need to go in and turn around since the stone blocked access to the front of the drop hole. The stone would also impede any child who needed to squat (Fig 4-15).

**Figure 4-13:
Negotiating corridors**



Another common observation was the non-use of doors or locks by students. Although no disabled child was directly observed using the latrine, able-bodied students tended to either not use doors or just push them slightly closed to indicate occupancy. This behaviour is assumed to be due to a disinclination to spend any longer than necessary in the latrines. Disabled children who need to spend longer using toilets may not behave the same way.

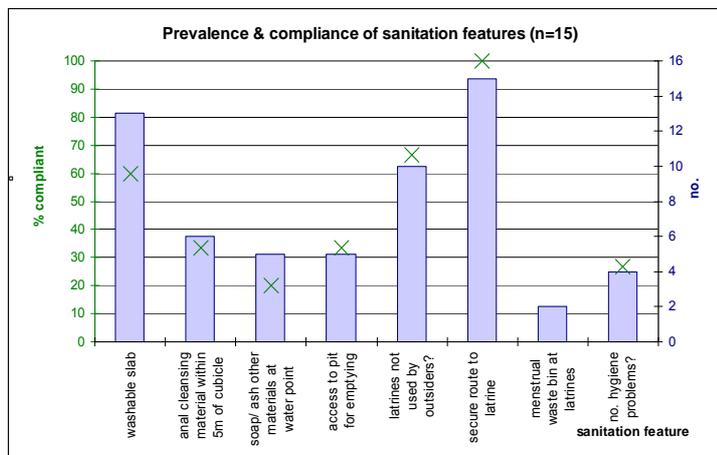
4.2. Good practice sanitation features

4.2.1. Types and compliance of sanitation features

Fig 4-14 shows prevalence and compliance of good practice sanitation features in the 15 PS visited.

The presence and compliance of good sanitation features varies greatly.

Figure 4-14: Good practice sanitation features



4.2.2. Details of assessed good practice sanitation features

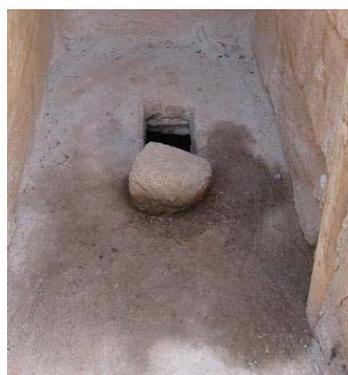
4.2.2.1. Water

To avoid duplication of findings on good practice water supply features, these are covered in Section 4.3

4.2.2.2. Washable slabs and drainage

Cementitious slabs were present in all but 3 of the schools. However some slabs had a high sand content meaning that they continued to absorb liquids and retain dirt. Earth slabs were only found at rural schools which also had earth corridors which can not easily be kept clean (Fig 4-15).. There was evidence of erosion of mud drophole edges at one school, presumably from urine, anal cleansing or rain. The direction of fall (slope) on slabs was checked with a spirit level but effective drainage is difficult to establish without actually using water. Drainage points from ramps, corridors and walkways were only found at 2 schools (Fig 4-16).

Figure 4-15: Non-washable slab



Hole between timbers in mud floor

Figure 4-16: Weepholes from walkway through kerb



4.2.2.3. Drop hole covers

School S17 had provided concrete drophole covers with metal handles which would be difficult for disabled children to remove due to their weight and because a removable seat was above the hole. S16 had only provided wooden covers to the “normal” cubicles, not to the accessible cubicle which had a blockwork seat.

4.2.2.4. Location and type of cleansing agents

Only 4 schools had any cleansing agent near the water point and three of these were special

schools. Other cleansing agents included paper, ash and soap.

At one mainstream school powder soap was lying on a bucket lid under a tippy tap which would not have been easily useable by wheelchair users due to it's location on grass.

Only in one school was ash observed in a pile on the ground outside the latrines but other indications of use included whiteness at dropholes which was seen at three schools, though staff of 5 schools mentioned use of ash.

The lack of cleansing materials at a number of schools could have been the reasons that students wiped their hands on cubicle walls as will be shown in 4.2.4.6.

4.2.2.5. Security of latrines

Restricting use of latrines by outsiders appeared not to be within the control of most of the urban schools where it took place. The lack of alternative facilities or perimeter fence prevents schools from stopping access. Limiting the community's "right" to use what are perceived as communal assets, such as school pipelines, may damage school relations.

Urban schools where latrines were closer to the main school buildings appeared to have more problems of vandalism even though none of the rural mainstream schools had perimeter fences.

The researcher supposes that this is due to greater community cohesion in rural areas.

S7's playing field is used by the community in the evenings and the toilets are also used. Locks have been removed and teachers said the toilets are left dirty.

S17, a small urban school with no perimeter fence reported damage to latrines and washbasins, with theft of taps from the newly constructed accessible latrines (Fig 4-17).

Figure 4-17: Taps removed from new accessible washbasin



The use of facilities by outsiders impacts all students if latrines are left dirty or fittings have been removed. Locking of teachers and accessible toilets was common practice in many schools which left the visitors the use of the main student latrines

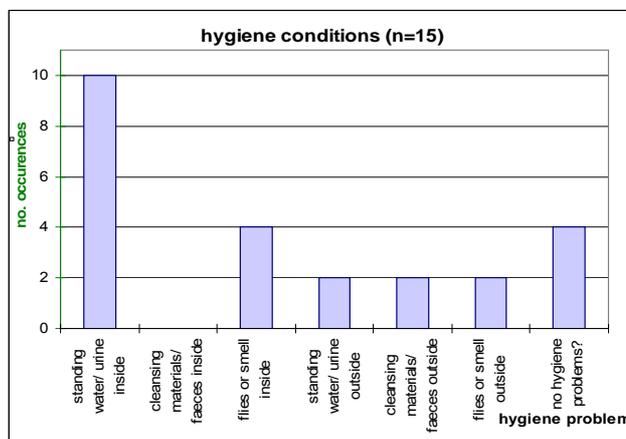
There were no reports of any problems with student safety reaching the latrines whether there was a fence or not.

4.2.2.6. Cleanliness

Although many urban schools visited were open, most rural schools had already closed for the holidays and therefore the audits will not have assessed the "normal" state of cleanliness.

Both internal and external cleanliness was assessed, however many of the compliance criteria are subjective and difficult to replicate e.g. smelliness, presence of flies.

Figure 4-18: Cleanliness



Although solid faeces was not found at any school, standing water and cleansing materials were found both inside and out (Fig 4-18).

For physically and visually impaired students cleanliness is the main barrier to latrine use (Fig 4-18). Physically disabled students inferred that they would prefer clean latrines to accessible latrines, i.e. they would continue to crawl. Although this may not be intuitive to those seeking to make toilets accessible, wheelchair users often also expressed a preference to be independent and not having to rely on others by using their chairs.

Obviously preferences of a physically disabled student depends greatly on the nature and severity of their disability, but improved cleanliness also encourages better student use of latrines.

Of the 4 schools which had no cleanliness problems, 2 of these were not yet in use, i.e. only 2 out of 13 toilets received a clean score.

At one of the other 2 schools, although the facility

audited was clean, an alternative latrine block was not.

On review of the field visit photographs, evidence that children were wiping their hands on latrine walls became apparent (Fig 4-20). This had not been anticipated and was not easy to see in dark cubicles. Therefore it was not consistently recorded and not used to measure cleanliness non-compliance.

Buckets of water in latrine blocks or cubicles were commonly observed. A number of adults said that children did not like to use water in buckets as they considered it to be dirty, i.e. another students could have washed their hands in it, but no child interviewed expressed this view

As dirty latrines are a major factor for crawling students one might expect them to be more interested in hand washing but their behaviour could not be observed.

The consistent lack of clarity from teachers about hygiene education content, responsibility for delivery and frequency, suggests there is an opportunity to improve sanitation use by all students and clean up latrine conditions for disabled children.

At 3 of the 4 special schools staff cleaned the toilets and the conditions were very good. At all the mainstream schools except one the students cleaned the toilets, though Standards I and II and disabled children are usually excluded from this task, and the toilet conditions were variable. At the remaining school parents contributed toward employment of a private individual who cleaned the toilets, but the observed condition was not good.

4.2.3. Menstrual Hygiene facilities

As primary school students are often older than the official school age access to menstrual hygiene facilities is important to reduce disrupted school attendance (2.7.2.4).

Figure 4-19: Water and waste



Figure 4-20: Faeces on walls of different schools



A disposal bin was only found in one toilet in one shower of a residential special primary school. Only one waste burning facility was found, a shallow open pit, whilst two rural schools said that menstrual waste was disposed of in collapsed pit latrines.

Only school S16 had a designated changing facility. This was an empty room without a seat, place to keep clothes, or facility to dry menstrual cloths. However an extra ramp had been provided to access this room which was at the opposite end to the accessible latrine cubicle.

4.2.4. Student latrine ratio

Student: latrine ratios are relevant to latrine accessibility due to the presumed relationship with cleanliness. The draft compliance criteria is 20:1 for girls and 25:1 for boys although a number of uncertainties regarding calculation of ratios arose during the field research due to the practice of morning and afternoon shifts. Notwithstanding this the range of ratios varied greatly.

Since, at all but one mainstream school, able bodied students are not allowed to use accessible cubicles, where they were provided the user: latrine ratio was low as there were relatively few disabled students.

However there were also schools where there were no accessible latrines, and therefore the ratio of accessible latrines to disabled students at these schools was infinitely high. At two urban schools the teachers' toilets were used by disabled students.

As could be expected, urban mainstream schools had the highest ratios, ranging between 250-364.

Only 1 out of 8 rural schools had ratios greater than 100:1. The highest ratio at a special school was 47 for both boys and girls. (Fig 4-21).

Only 3 mainstream schools met the boys target ratio and only 1 mainstream school met the girls target ratio.

4.2.5. Observation of use

There was evidence that water was used to clean latrine blocks since the volume of water on some floors could not be due to anal cleansing alone. However the extent of standing water also indicated problems with slab drainage (4.1.2.2, 4.2.2.2).

No student who crawled was observed or when asked said that they used any form of hand or knee protection. It is not clear what measures they take during the rainy season to keep themselves clean and safe.

The nature and location of cleansing agents observed suggested non-habitual use, with soap and ash stored in a variety of places, often out of reach of children. The dried out appearance of many soap bars suggested that they had been forgotten (Fig 4-22).

The condition of some toilets suggested that attention to cleaning was not a priority or lacked resources and supervision. As many schools were closed or only attended by students taking exams it is unlikely that the level of cleanliness seen was "normal"

Figure 4-21: User : latrine ratios

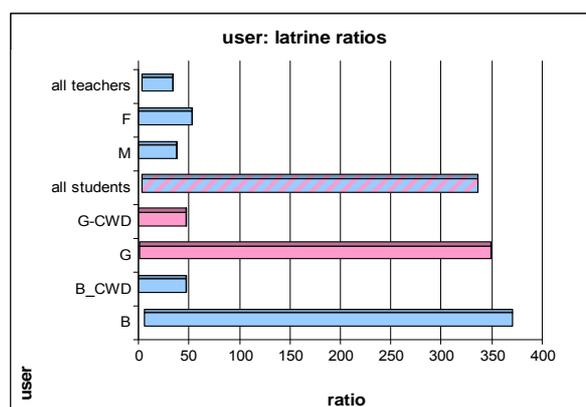


Figure 4-22: Soap on cubicle wall

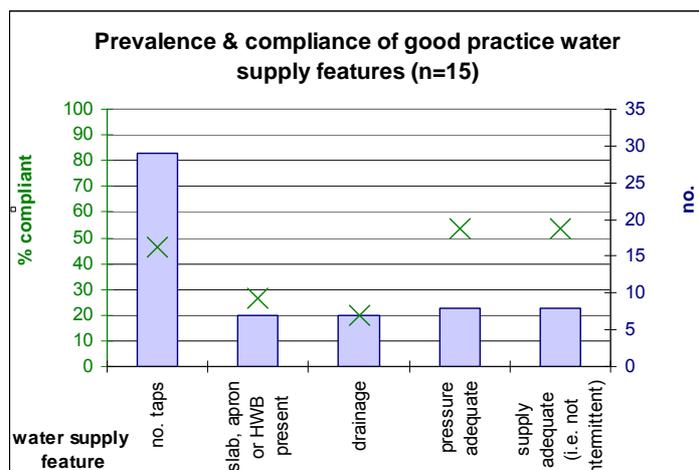


4.3. Good practice water supply features

The data in this section draws from the school accessibility audits and observations.

4.3.1. Type and nature of water supply features

Figure 4-23: Water supply features



Water may be used for anal cleansing, flushing or hand washing.

As for sanitation, those good practice water supply features that are considered relevant to physical accessibility were scored.

Fig 4-23 adjacent indicates the number of times each feature was found present, and the percentage level of compliance.

4.3.2. Condition of features

4.3.2.1. Number and type of taps

Taps that were associated with daytime latrine facilities were assessed. This excluded taps designated for kitchens or in dormitories. The number of taps or water points ranged from 0-12, with a median of 1 tapstand for daytime student use per school. This is equivalent to student: tap ratios of 8-2987, with a median of 1022. Although there is no guidance in NG SWASH on the number of taps per student, Reed and Shaw (Reed, Shaw & Chatterton 2008) suggests 1:50 is a good ratio but only 4 out of 15 schools met this criteria.

Overall compliance was recorded at 0% since none of the taps had handles which could be used without gripping.

The only place where such a lever handle was observed was at the CCBRT facility (Fig 4-24). Many taps were damaged making their use more difficult. Tap locks were not found at any of the schools audited, but were seen in another school. However locking taps during school

Figure 4-24: Taps



hours is not practical and locking out of hours may cause difficulties with the community if they perceive school facilities to be communal.

4.3.2.2. Aprons and Drainage

The accessibility of aprons and drains for disabled students are not simple to assess since it depends upon the nature and severity of their disability as well as the specific arrangement of the apron or drain. Depending on design and condition, either the inclusion or omission of aprons can hamper disabled students' access to water (Fig 4-25).

Figure 4-25: Aprons and drainage



4.3.2.3. Distance

The lack of clear guidance about the maximum distance does not help in assessment of this aspect of water supply. Taps were either provided within the cubicle or cubicle block, or one tapstand served the whole school usually located some distance from the latrines.

Figure 4-26: Handwashing point



Only 6 schools had water within 5m of latrines and all were urban schools. Only at School S13, where the piped water supply was not working, had a designated hand washing water point been provided close to the latrines (Fig 4-26). 8 out of 15 schools had water within 50m of latrines. At School S17, a tippy tap had been provided immediately adjacent to the latrine, but was not functional and had no water. However, this was a small urban school and the tapstand was within 15m of the accessible toilets.

Even where water had been specifically provided near the latrines observed behaviour suggests that handwashing after latrine use is not the norm amongst students. The reasons are not clear, but distance to the water point is one barrier although adult informants suggested culture is the main (4.3.3.1) cause. The distance of taps from the latrines in 60% of schools was probably far enough to discourage use by students

4.3.2.4. Accessibility

In addition to the number and type of taps, water accessibility is a function of tap location and arrangement. 6 out of the 29 taps audited met the height criteria and were typically unsupported galvanised iron pipes sticking out from the ground at heights ranging between 200-1300mm above ground level. Very low taps cannot be easily reached by children using wheelchairs or crutches, whilst high taps cannot be used by small children or those crawling.

Fig 4.3-5 shows a tap that feeds directly into the tank which is uncovered and contaminated. It would not be possible for a small child or wheelchair user to access fresh water.

Many schools required students to fill buckets to take to the latrines (Fig 4-27) which would not be possible for some physically disabled students, reducing their independent use of latrines

Figure 4-27: Inaccessible tank



Figure 4-28: Carrying water



4.3.2.5. Water sources and storage

All urban schools had some form of water supply and, although compliance levels for pressure and supply continuity are not defined in NG SWASH, only 7 schools had both adequate supply and

pressure in the researcher's view.

6 of the 8 rural schools had limited water supplies whilst 2 schools had no water at all and children were required to bring water from home which adds to the difficulties of reaching school for disabled students and may lead to them being isolated if they are either exempted or unable to do so. 2 rural schools had rain water harvesting tanks, but one school's tanks had cracked and were not in use. The tanks at the other school were new and no water had been saved during the previous rainy season due to gutter blockages.

4.3.2.6. Water used by outsiders

S8 had a single water point with 2 taps, one of which was damaged and strapped shut with tyre rubber to stop leaks. During the visit a woman was observed filling a bucket from the working tap whilst students waited. The HT Assistant said that the water is *"used for free by community, who can cause damage and don't pay anything"*.

Two rural schools stated that low pressure or no supply was due to community connections to the school pipeline, about which they could do nothing.

4.3.3. Observation of use

4.3.3.1. Handwashing behaviour

The lack of water was raised by adults and students as a major barrier to sanitation. Observation noted a lack of handwashing by students after toilet use, but handwashing in general was commonly observed with queues and congestion at water points. Key Informant EM said *"the children are being taught, but the community don't think there is any importance to wash hands and so they don't insist the children should wash their hands, It's not in the culture"*.

4.4. Problems of implementation

This data is based on both observation of facilities, use and from interviews with students and school staff.

4.4.1. Accessibility design and construction failures

During school visits it was not possible to determine the cause of poor implementation, i.e. design or construction, but in a number of cases accessibility had been compromised due to the final arrangement of the facilities. The example of ramps made redundant by narrow doorways or internal steps has already been described in 4.1.2.2, and locks that are too small to be used in 4.1.2.3.

The drophole and seat in S16's accessible cubicle were located centrally to the cubicle, contrary to the original WEDC design on which it was based, and therefore the extra cubicle cannot be accessed by a wheelchair (Fig 4-29).

It is not known if this occurred due to an oversight by the designer/ client or by the

artisans. It is notable that the wheelchair user at S18 does not take his chair into the latrine which is of the same design as S16, though it is not clear if that is by preference or because it does not fit.

In a number of schools where latrines had been designed as full flush, problems with water supply or maintenance meant that they were now being used as pour flush. Resulting buckets in cubicles

Figure 4-29: Central drophole



Figure 4-30: Bucket obstruction



often obstructed access to the latrine (Fig 4-30). Since it is usually considered good practice for taps to be within reach of latrines to allow cleaning before transfer back to a wheelchair, this suggests that greater thought about internal arrangement of cubicles is necessary.

Although on site adjustments are sometimes unavoidable, where internal dimensions on drawings had been read as external dimensions this was clearly a problem for wheelchair users.

4.4.2. Access to technical advice on accessibility

It seems that knowledge of accessible designs and where to find advice on accessible design is non-existent. Even those schools which CCBRT supports failed to identify them as a possible source of technical advice.

For all public schools, plans for renovation or construction of new facilities go through the local education authority. A public special school had relied on the municipality for latrine design and although the cubicles were large, they had no other specific accessibility features, e.g. guiderails or tactile markings to aid the visually impaired students.

To facilitate processing of applications, schools often develop their own designs and cost estimates for submission, relying on any technical advice they can access. However this advice rarely has experience of accessible design as noted in Box 5.3 for school S9.

The secondary school (S2) management, having identified the need for a new accessible toilet block, had approached the Rotary Club and MoEVT for funds. The Rotary Club had sourced the design advice but the school had provided feedback based on their experience before the works commenced.

Privately funded School S3 for the physically disabled said that they had developed the design from scratch based on meetings between school staff and the municipal Special Education Engineer, benefitting from the staff knowledge of the students' needs. Key Informant GV of the Municipality confirmed this, but was unclear how lessons learnt from construction and use were being shared. Only two mainstream schools where CCBRT or WaterAid had not been involved had considered the accessibility of their sanitation facilities. Both School S16 and S18 had received support from Plan Tanzania, who include accessibility in their sanitation programmes, and as such the school had no input in the design of the facility. S16 had not requested accessible facilities as confirmed by staff who said they have no disabled student presently enrolled

This underlines the need for MoEVT Infrastructure Department involvement in finalising the NG SWASH and review of the MoEVT standard latrine designs, the key sources of information for municipal engineers.

4.4.3. Sanitation and Water supply design and construction failures

A number of problems of implementation were found due to multiple latrine technology types used within the same school. Reasons for use of both pit and flush latrines include:

- Reluctance to dig additional pits - leads to use of pour or full flush facilities connected to existing pits
- Aspiration/ expectations for flush latrines - primarily for teachers' facilities

As flush latrines require greater quantities of water, this had led to problems in many schools due to.

- Intermittent water supply – leads to use of other cleansing materials causing damage or blockage

- Insufficient water quantity – leads to pipe blockage, insufficient water for other hygiene uses
- User behaviour – students prefer/ familiar with solid cleansing materials

School S7 and S10 both had latrine blocks which had been designed as pour flush but were completely out of use due to a combination of lack of water, incorrect use by students and poor design/ construction of plumbing.

Staff confusion about the exact cause of blockages suggests that schools are not clear about the basic requirements for successful flush toilet management. Both schools had wasted significant time, money and effort in constructing facilities which were of no benefit.

4.4.4. Structural collapse

At a number of schools there was visible evidence of structural movement, but it was not clear if this was due to pit collapse or subsidence of backfilled areas. A number of pit latrine slabs were damaged and students at the school for the visually impaired stated that it was easy to fall in hence they preferred the new toilets with ceramic squat plates. The corridors in three schools were damaged due to subsidence resulting in large holes in the slabs which would discourage students with visual or mobility difficulties(Fig 4-31).

Figure 4-31: Damaged concrete slab



4.5. School grounds and other buildings

Although accessibility of schools in general is not the focus of this study, it is clear that accessible SWASH in an inaccessible school will not facilitate inclusive education for disabled children.

This section provides some context for the type of physical environment that disabled students have to overcome to reach the latrines. This data comes from the Accessibility Audits and observations.

4.5.1. Type and nature of school buildings features

13 out of 15 schools visited had classroom doorways raised above the adjacent ground level to cope with the rainy season runoff (4.1.2.2). Standard MoEVT drawings include a 1.5m wide raised veranda along the front of classrooms.

MoEVT roof designs show cantilevered roofs but many of the schools visited included column supports, which further restrict veranda widths (Fig 4-32).

Doors open both outwards and inwards which affect a disabled student's access from a veranda. It was notable that the school for the blind had made no efforts to improve accessibility and had a wide range of physical barriers to reach classrooms. In the special schools, except the school for the blind, ramps were the most common accessibility feature provided.

Figure 4-32: School verandas and steps



4.5.2. School grounds and footpaths

Most school grounds, even in urban areas were unmade sand or earth. For students in wheelchairs, reaching the classroom from the school gate across the playing field would be a significant effort.

One parent was observed taking a taxi up to the classroom entrance in order to collect his son.

Urban schools were often congested with vegetated areas in beds protected by raised kerbs, whilst rural schools generally located latrines some distance from the classrooms. Both these issues would make movement around the school difficult for visually or physically impaired children.

4.5.3. Condition of features

The concrete edges on verandas and steps were often damaged, reducing the width and stability of steps, including footrests (Fig 4-33). Both ramp and veranda surfaces had exposed aggregate which may provide a surface on which disabled children are less likely to slip, but also may result in trips or damage to wheelchairs.

Figure 4-33: Damaged footrests



4.6. Enrolment and participation of disabled children

Although this study has not been designed to use statistical methods, some comparison of the data from schools visited, based on interviews with staff and students, has been made against national data on disabled children in school to provide context for the findings.

4.6.1. Secondary data

This section uses secondary data generated from the 2008 NDS and 2010 BEST report to compare the representativeness of the field research sampling and findings to the national data on primary school students. Comparison is not possible for out-of-school children since the research only collected data on students and not the general population.

A number of difficulties associated with secondary analysis were encountered such no control over data quality evidenced by apparently inconsistent data and absence of key variables, specifically disaggregation by age and disability type to isolate the information relevant to disabled primary-school-aged children (2.2.5) (Bryman 2004).

4.6.2. Enrolment rates

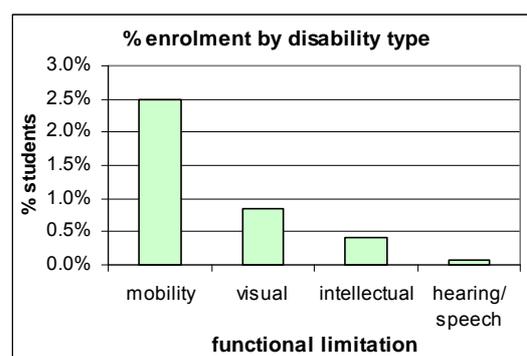
The field research found that, for the schools visited, the proportion of students with disability was 2.8%, the same as the NDS statistics (2.2.5). This finding will have been affected by the fact that 3 out of 15 schools visited were special schools.

4.6.2.1. Disability type

The percentage of disabled students enrolled in the primary schools visited is shown in Fig 4-34.

Although the research targeted a number of special schools, only 2 children with hearing/ speech problems were met, therefore the distribution of disability in this study is not as diverse as the NDS findings. This seems to reflect the inability of mainstream/ inclusive schools to accept children with speech difficulties since none of the schools visited were able to use or teach sign language.

Figure 4-34: Enrolment by disability type



4.6.2.2. School type

In the field researched schools, 19% of disabled students were in mainstream schools. Only children

with relatively minor hearing difficulties seemed to be able to cope with mainstream schools due to lack of teaching ability and materials. No hearing/ speech impaired children attended the special schools visited.

4.6.2.3. Urban rural

As could be expected, the percentage of disabled children found enrolled in urban schools (4.8%) was higher than the percentage enrolled in rural schools (2.7%).

4.6.3. Attendance

It is very difficult to assess the impact of accessible sanitation on attendance. Two boys were found to go home rather than defecate at school toilets, but this was due to lack of cleanliness rather than inaccessibility. One girl said she returned home to wash during her period and sometimes stayed off school, CM1 said she did not come to school at all during her period. No child said they missed school because toilets were inaccessible, however it is difficult to know if either the subject was too sensitive (3.12.3.5) or the inaccessible latrines made it too unpleasant.

4.6.4. Completion and Attainment

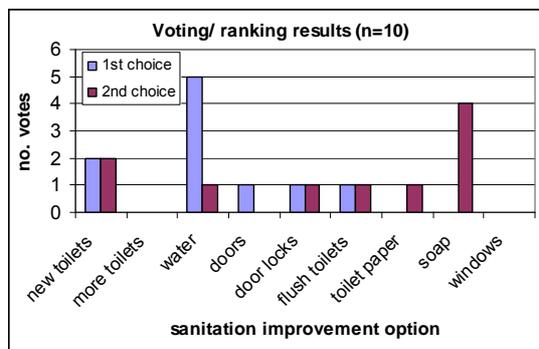
4 out of 28 disabled students interviewed and 5 disabled adult informants had completed primary school. 2 disabled students were still in secondary school and 2 of the disabled adults were now teachers and therefore had proceeded to tertiary education.

There was a general view amongst teachers that disabled children are “slow” in completing their work though one teacher was full of praise for his disabled pupil who consistently came top of the class. For intellectually impaired students the researcher was given the understanding that although they may complete primary school, few really gained a proper education and none proceeded to secondary school.

4.7. Disabled students’ views

The findings presented here are based on the interviews with 33 disabled children, 28 of whom are in primary school, 1 dropped out, 2 completed but did not continue their education and 2 are in secondary school. The preferences found from the pocket chart voting/ ranking exercise are also presented in this section (Fig 4-35).

Figure 4-35: Voting/ ranking results

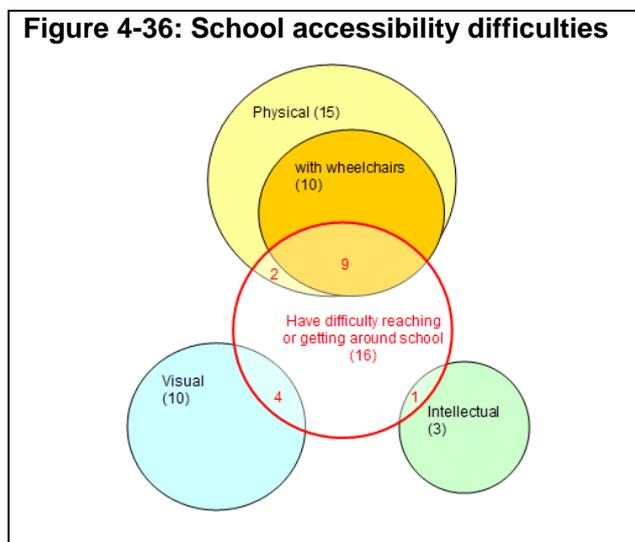


4.7.1. Views on school toilets

4.7.1.1. Access to latrines

Access difficulties did not affect students with hearing or speech impairments (Fig 4-36). 10 out of 33 students only came to school if someone came with them, either to accompany them or to assist them. 9 of these children were wheelchair users of whom 6 did not use their chairs once at school. 4 students with mobility difficulties could only reach the toilets with the help of a friend or teacher, of whom 2 were wheelchair users.

Figure 4-36: School accessibility difficulties



Wheelchair users who said they had no difficulty were those who did not use their chairs once at school. SS2 said he would prefer if the latrine steps were replaced with a ramp.

4.7.1.2. Access at latrines

7 students said that they had difficulty within the latrine block, either because latrines had steps or cubicles were either too big or too small. The reason for difficulty in large cubicles is that there is no support.

4.7.1.3. Cleanliness

Many disabled students cited cleanliness as their main reason for disliking school latrines, causing some students to avoid their use altogether or use alternative facilities. 13 out of 28 students said school latrines were not clean and 11 said they were smelly. AS1 said that the latrines were dirty but since he only attends the morning school shift, he has so far avoided using them for defecating (4.7.1.11). Student CM1 is unable to use her upper limbs and she uses the toilets with difficulty. She misses school when she has her period. Her friends carry water for her and she has chosen a small cubicle in which she can support herself, but it is used by other students and sometimes gets dirty. She advised that if the school toilets are dirty then a friend helps her to use the pan beneath the removable cushion on her wheelchair (Fig 4-37). In either case, as she cannot use her hands, she is unable to clean herself.



Figure 4-37: chair with removable cushion

4.7.1.4. Water

5 students out of 28 said that lack of water was a problem and, of the 10 students involved in the voting/ ranking activity, 6 selected water with 5 of these choosing it as their top priority. For 3 students at the school for the visually impaired all prefer the new flush latrines as there is better chance that they and previous users have left them clean.

4.7.1.5. Cleansing materials

In the voting/ ranking exercise, 4 students out of 10 selected “soap” as their second vote and 3 of these had chosen water as their first priority. Only one child chose “toilet paper” and as a second vote to “flush toilets”.

4.7.1.6. Safety and support

The majority of schools had cement or concrete pit slabs. School S9 has plastic slabs but a number of rural schools had mud floors supported on timbers.

The head teacher said the plastic slabs were a concern at the time of installation, but since there were no toilets at all when they were built in 2005, the construction had proceeded (Fig 4-38). As a result boys stand outside to urinate to avoid standing on the sanplat. The use by girls could not be observed without invading privacy.



Figure 4-38: Plastic sanplat

As noted in 4.4.4 the condition of some slabs was not good causing risk of trips and falls.

1 student said that the wet slab was slippery whilst 5 said they felt unsafe squatting over dropholes, either due to slab condition or the size of holes. Concern was not expressed where ceramic pour flush squat plates or full flush pedestal toilets were provided.

In schools without supports, seats were not identified by students as beneficial, and when suggested by the researcher many expressed concerns about cleanliness. This perception that seats are dirty is not confined to disabled students but to most Tanzanians who do not have experience of pedestal toilets.

Handrails were not explicitly identified by any student as helpful though, as noted in 4.7.1.3, CM1 said she had a preferred small cubicle and in which she could support herself and JN is seen using the handrails in 3.14.4. The researcher's view is that CM1 is not aware of the concept of handrails.

4.7.1.7. Not enough toilets

Although students mentioned that toilets were used by many people and inferred that this was a reason for lack of cleanliness, none of the students selected "more toilets" in the voting/ ranking exercise.

4.7.1.8. Privacy

- Interestingly only 1 boy student in the voting/ ranking identified doors as a priority, whilst the same boy and an older girl chose door locks as a second priority.
- Two wheelchair students mentioned privacy as a barrier and that they would like their own cubicle which only they used and that had a door which could be closed. Both these girls crawled once at school as it provides them more independence. They were more interested in cleanliness than the ability to take their chairs to the latrine as they cannot wheel themselves.
- Student IM was reported to go home to defecate, but the reasons cited were age and religion as he is older than the other students and it would not be appropriate for others to see him in the latrines.
- Student TS1 who has completed PS said she used to return home if she was menstruating and sometimes missed days of school. She also said she would probably still have returned home even if changing and washing facilities had been provided.

4.7.1.9. Light

Only students at one school stated that the toilets were dark, when given the option, none of the 10 students in the voting/ ranking exercise voted for "windows".

However the researcher's observations is that light levels both affect and are affected by cleanliness. Poor lighting leads to poor cleaning and low cleanliness increases the desire for better lighting.

4.7.1.10. Technology type

Three visually impaired students stated that they would prefer full flush toilets for the reason of cleanliness explained in 4.7.1.4. As noted in 4.7.1.6 five students preferred pour flush toilets due to perceived safety compared to dropholes. 1 student selected flush toilets as a first choice and one as a second choice in the voting/ ranking exercise.

4.7.1.11. Observed disabled children's toilet use

As explained in 3.13.1 it was rarely possible to ask students to demonstrate use. Only 2 "demonstrations" were observed.

A secondary school student with a leg amputation used crutches. Although both squat and pedestal toilets were available, she preferred the squat toilet and used only 1 crutch to balance during the demonstration. She did not look very stable, but the researcher was unable to ask further about how

she used toilets when unwell or during her period due to the absence of the interpreter. The researcher's view is that, as an amputee, she is used to squatting.

As mentioned in 4.7.1.3, students have developed various coping methods for dealing with inaccessible school toilets. AS1 can balance to urinate but uses his crutch to squat (Fig 4-39). This is not possible in school as the cubicles are too small, dirty and he does not trust the plastic sanplat. He only uses the school toilets to urinate and avoids eating and drinking before coming to school.

Figure 4-39:AS1



4.7.2. Disability aids

In addition to the specific requirements of wheelchair access outlined in Box 4.1 there is a need for safe and clean places to store aids e.g. canes, crutches and callipers.

A bench had been provided in the corridor space of a special school's toilets for this purpose, but the teacher noted that handrails to aid access from the corridor into the cubicle had not been provided.

4.7.3. Key barriers to education

As the previous sections show accessible sanitation was not identified by disabled children as a barrier to accessing education. Although not the focus of this report, to put the accessibility difficulties of school sanitation into context, some of the common barriers mentioned by students are provided here. It should be noted that many students were unable to explain why they had started school late since this was not within their control, but decided by their parents.

4.7.3.1. Societal attitudes

3 students said that community members had discouraged parents from sending them to school, and in 5 cases one parent had been disinclined to enrol them. However these attitudes had been overcome by other community or family members or by approaches from school staff. No students mentioned teacher or non-disabled students' attitudes as a problem, but are likely to have been discouraged to do so by the presence of teachers or municipality personnel during interviews.

4.7.3.2. Distance to an appropriate school

Distance to school was a commonly raised issue with emphasis on different aspects, similar to the findings of a 2005 assessment in the Tanga Region (Tanga Coalition 2005:16,17) .

- nearest school refused to enrol them due to their disability, specific reasons not known (2.7.2.1)
- families thought they could not attend mainstream school, and special schools are too far
- costs of either transport or lodging at special or inclusive schools ruled out this option

Only the parents of two intellectual impaired children mentioned that they would also worry about their child coping with school even if they could afford the cost.

For many physically disabled students in wheelchairs the nature of the terrain or their small size meant that they need help to get to school (Fig 4-36). The majority of wheelchairs in rural areas were damaged but still being used. All the wheelchair users interviewed in urban schools were residential students but teachers mentioned that, particularly during the rainy season, parents of day students often carry their child to school due to the road conditions.

4.7.3.3. Concerns about starting school

When three visually impaired students were asked about concerns on joining their new residential school, none raised infrastructure or sanitation. Their concerns were a normal child’s fears about making friends and missing family.

4.8. Adult views

Although not all of the 29 school adult representatives interviewed were teachers, all worked with students directly either as teachers, rehabilitation specialists or matrons. Therefore for ease of reading they are generically referred to as “staff” unless specifically referring to teachers.

Very few staff identified sanitation as a barrier to inclusive education and therefore some of the other issues they raised are presented here. However lack of experience of using the student toilets was noticeable amongst many respondents, with unclear explanations for observed adaptations e.g. placement of large stones near dropholes. This lack of awareness is also found in NG SWASH where a picture of the girls’ urinal has the child facing the “wrong” direction (URT MoHSW 2010:47).

4.8.1. Thoughts on school sanitation

4 staff mentioned that infrastructure in general was a problem and 3 mentioned inaccessibility of school buildings. Only 3 out of 29 staff mentioned that sanitation was a barrier to inclusive education before the subject was raised by the researcher (Box 4.2).

Responses to questions about latrine use by disabled students indicated that many had no idea how disabled students used facilities even though they were aware that some children would be unable to dress or clean themselves. Many of the responses were conflicting and did not stand up to further enquiry, but were avoided by interviewees.

Box 4.2 Adult views on school sanitation	
<i>“Parents are actively concerned whether toilets are accessible or not when deciding to send them to school”</i>	Head Teacher at Special pre-school DP
<i>“Infrastructure is one of the barriers to disabled children accessing education. A boy from Tabora region was selected to go to Secondary School in Shinyaga, but he left school because he was afraid to eat and drink as he was afraid to use the toilet. So instead the government transferred him to a Dar es Salaam Secondary School – this school receives many disabled children and has two schools, dorms and special toilets and ramps. It’s an inclusive secondary school”</i>	
Assistant Head Teacher FF	
<i>“I was worried that she couldn’t get herself clean. I was worried about her using the school toilets”</i>	
Parent of EE1	

4.8.1.1. Sanitation a barrier to inclusive education?

There were a number of different and sometimes conflicting attitudes and responses to the issue of sanitation access.

5 staff of the 29 school interviews agreed that sanitation was a barrier once the issue was raised by the researcher. The issues were: lack of water, cubicles too small/ privacy, cleanliness and safety related to drophole size.

- A special pre-school for the intellectually impaired provided a pair of toilets with every classroom so that accessibility barriers were reduced, despite the cost.

- School S9 had recognised the problem of toilet accessibility and already instructed the contractor building the new toilets to provide ramps to the student entrances. However the school could not have consulted with wheelchair users or they would have realised that the doorway and corridor were narrow and restricted access (Box 5.3).
- JM4 noted that the physical infrastructure was a barrier and that there were no ramps to the toilets which prevented access by wheelchair users.
- Teacher RB said that the environment at the school for the visually impaired was not friendly to those with disability as there were stairs to the classrooms, hostels and bathrooms

4.8.1.2. Accessibility not on the radar

- JM4 stated that when the latrines had been built in 2002 there had been no disabled children in school and therefore there was no allowance made for accessibility.
- Similarly EG stated that although some students with low vision were attending school, when the toilets were constructed, no special adjustments had been made when planning the facilities.
- Although she had earlier stated that physical infrastructure was a barrier to inclusive education, when asked directly, the Head Teacher of School S3 said toilets were not a key barrier to education.
- Teachers at S10 said none of the intellectually impaired students at the school used wheelchairs and all were able to access, lock and flush the toilets. No student has a problem using the facilities (3.12.3.5).
- TS2 pointed out that although infrastructure is a barrier, even with inclusive latrines, students would still need special teaching materials.

4.8.1.3. Water

Water was cited as a problem in relation to anal cleansing and handwashing rather than flushing or latrine cleaning.

4.8.1.4. Cubicle size/privacy

Teacher FF noted that as disabled children often need assistance to use the toilet they need space, but as the latrines are used by so many students, there is no privacy.

Teachers at S10 also said that staff encourage their friends to help the disabled students who are unable to dress themselves so.

4.8.1.5. Cleanliness

Agreeing with his students (4.7.1.4) a blind teacher said that pour flush was helpful for cleanliness reasons, but that pour flush was adequate since it uses less water in an area with water shortages. He also said that seat toilets were not liked since they get dirty, and that squat pans were better even though the researcher pointed out that a visually impaired person may also unintentionally leave a squat plate dirty without realising to which there was no response.

4.8.1.6. Safety

RB said that he located the squat hole with his foot rather than his cane.

As noted in 4.1.2.7, LC stated that the intellectually impaired students at her special school prefer to use the pedestal rather than squat toilets even though there was no plastic seat and the hole is big, but she could not explain why.

4.8.2. Hygiene behaviour and latrine cleaning

Adult responses to specific questions about hygiene education and cleaning activities indicated that teaching staff did not feel that this was their responsibility and that latrine use and cleaning activities were taught by older students to younger ones, mostly informally through Child to Child clubs and activities.

Although teachers knew which classes were involved in cleaning and all stated that disabled children were excluded from the task, when asked they often did not know whether disabled children were allocated other tasks instead, to reciprocate for non-disabled students cleaning the accessible toilets. This suggests that they were responding with the “right” answer rather than admitting that they did not know.

4.8.3. Benefits to the community

- The Head Teacher of School S3 said “*some parents who saw the school toilet have brought contractors to see it so they can build similar at home. Most of the parents are using the chairs as it is helpful to their children’s problems*”.
- However, Head Teacher BS whose school is on the same plot as the special day care centre supported by CCBRT said she had never seen the toilets there and did not know about the temporary seats.

4.8.4. Staff awareness and understanding of disability

Most mainstream staff had not given the issue of disability much thought and were unclear about definitions of disability often contradicting themselves.

- Shame - A number of staff said that to have a disabled person in the family is a cause for shame and that fear of penalties for failing to enrol a child in school adds to the practice of hiding disabled children (Tanga Coalition 2005 p16)
- Awareness of education options for disabled children - Many staff acknowledged that awareness of education opportunities for disabled children was limited though it was improving. Particularly for more severely disabled children, neither parents nor staff were familiar with the possibilities.
- 12 staff said they knew an organisation from whom they could information on disability

Box 4.3: It’s a DISASTER

“In African families, disability is a disaster in our home. If someone [in the family] wants to marry we have to hide them [the disabled person], it’s a big taboo.”

Special school orthopaedist HT

4.8.5. Knowledge and views on inclusive education

Although not all issues relate to sanitation, this information provides the context in which accessibility issues and inclusive education exist in Tanzania at the current time.

- Policy - most staff were aware of the Education For All policy. Some were aware of the concept of child rights, e.g. to education, but few were knew of government policy on special needs education.
- Compulsory primary education - many staff were aware that it was obligatory for a parent to enrol children in school, but few could name the particular regulations or enforcing authority in their area.
- Inclusive or special education? - Head Teacher MD said that although “*it depends on the*

condition of the child, inclusive education is more important, as there are many children with disability and so more opportunity to access education. Not as many children can access special education". Clearly this view is influenced by the limited extent and access to special education in Tanzania at this time.

- Cost of special education - EE, a physiotherapist said "*special education is very expensive and needs a lot of staff. [Due to the competition for places] special school places are not being utilised by those who have more severe needs and cannot attend inclusive schools*"
- Encouraging enrolment of disabled children - special needs teacher MS said although he initially wanted to attract students to attend his class now "*if the accommodation and classes are full, why should I bother getting some more*".
- Social exclusion - A number of staff identified that special schools segregate children from their communities which has negative effects on both the child and the community.
- Teacher capability – levels of training varied in duration and content. While teachers in special schools said that they were equipped to teach disabled children, those at inclusive schools often felt insecure about their ability.

4.8.6. Views on institutional support in relation to accessible sanitation

- The enrolment of disabled students in mainstream schools has resulted in de facto inclusive education, but the lack of support for special needs education that registration would bring was highlighted by all staff. However lack of formal registration as an Inclusive School was not used as a reason for mainstream schools to refuse students, particularly in rural areas (Tanga Coalition 2005:17).
- The Capitation Grant, which is supposed to be disbursed monthly and of which 20% is allocated for refurbishment, often is not provided or is late but is wholly inadequate for its purpose and certainly insufficient to provide accessible school environments.
- The presence or lack of technical support for accessible infrastructure design was not mentioned, probably since there is low awareness of the concept.

4.8.7. Key Informant Interviews

As for the school interviews, in order to prevent interviewees being influenced or prompted by the researcher on the subject of accessible school sanitation most interviews were wide ranging. However only the views expressed relevant to the research topic are presented here.

4.8.7.1. CCBRT – Advocacy Officer

CCBRT are a key source of medical support to disabled people in Tanzania, with people coming from all over the country to their hospital in Dar es Salaam. Many CCBRT staff have disabilities and therefore a number of accessible toilets have been provided to their buildings.

SB said that as part of their schools programme, they have provided a number of accessible toilet blocks as well as improved general accessibility in some schools. As CCBRT do not have a technical background they have employed professional firms to undertake design and cost estimates for these works. She noted that the main challenge has been the construction phase where contractors adjust designs to suit the conditions or their own understanding, and that lack of supervision or supervisor awareness has resulted in some doors, ramps and landings at CCBRT not being accessible by wheelchair users.

She explained that CCBRT had trialled temporary stools and chairs as well as the plastered block seats with children to determine which were found more comfortable (UNICEF et al n.d., Cabot 2010). These had been the basis for the designs in the draft NG SWASH. SB noted that the “keyhole” opening in seats, though maybe more comfortable, was difficult and expensive to form and asked about its origins.

4.8.7.2. CCBRT– School Coordinator

“The physical environment is a barrier at school and at home, as many families rent and cannot adapt their latrines. Toilets are a common problem at school as it is either not accessible or so many children are using them that they are dirty. This coupled with lack of access to water is a big challenge”.

EM, who has been involved in some of the accessible sanitation pilots, said that the main reason for lack of accessible sanitation is failure to implement government policy due to political rather than financial reasons. He felt that if budgets were allocated directly to schools rather than through the MKUKUTA programme there would be less bureaucracy, a view also held by TENMET (TENMET 2009). He highlighted communication between the various stakeholders as critical to the successful implementation of accessible school sanitation.

With regard to technical advice EM said that the MoEVT Engineers should be able to provide schools and the regional educational authorities with information as standard MoEVT drawings already allow for accessibility. In his view problems arise when standards are not followed. EM said that the type of accessibility features required depends on the type and severity of a child’s disability, but handrails inside and outside were very important.

4.8.7.3. Municipal Special Education Officer, Dar es Salaam

GV was the first Special Education Officer in Tanzania, appointed in 2009. He is responsible for special education in one of the 3 Municipalities of Dar es Salaam and for 774 disabled primary school children enrolled in public schools.

GV said *“although there is a requirement for buildings to be accessible, in the real situation things are yet to be done”*. He said that although standard designs are developed by MoEVT the local municipal engineers are responsible for designing facilities according to the students’ needs with the advice of the Special Education Officer. For example S4 developed their own schools sanitation designs and these have influenced other facilities designed by the municipal engineer. However he was not clear how this information is shared.

He said the size of wheelchairs was taken from people who sell wheelchairs. There are no special requirements for taps or locks. He said that it was not good if ramp slopes required a child to be pushed.

GV acknowledged that funding was a major barrier to accessible construction and that he often processes school project proposals to interested NGOS or private companies.

GV said he had not been involved in the NG SWASH development though he had facilitated a CCBRT seminar on seat designs. He admitted that SWASH is a *“formality”* and that the 20:1/ 25:1 latrine ratios *“are a dream”*, but that it was a good thing for people from different sectors to work together to develop solutions.

He said that flush toilets are new in schools due to the lack of water. Of 107 PS in his municipality, only 18 have piped water and 61 have an on-site source with no water quality checks. He said lack

of water is a major hygiene problem and why so many children do not wash their hands before eating.

4.8.7.4. Municipal Special Education Coordinator, Dodoma

AK is responsible for 43 public primary schools within her district and 233 disabled students as of 2010.

When asked about the barriers to disabled children AK said that people's awareness and attitudes to education were the main problem and even parents with "*normal children don't feel the need to send their children to school*". Sanitation was not a barrier in her view.

4.8.7.5. UNICEF WASH Specialist

The WASH specialist explained that accessible sanitation was just one component of the draft NG SWASH, but it was the one of main components of the SNV led piloting in 3 districts. The pilots included new sanitation construction, rehabilitation, some water supply and governance elements. She advised that pilots with other implementing agencies was occurring in 10 other districts, but these were at a later stage of progress and no construction had been undertaken to her knowledge WM advised that all District Education Officers had been issued a full set of the Draft NG SWASH at a workshop and that feedback has been requested with finalisation planned by June 2012 (UNICEF, CCBRT & EEPCO n.d.)

With regard to implementing disability and accessibility policies she said that "*although higher level officials have awareness, awareness at civil society level is not there*".

She identified a number of barriers to inclusive education including family attitudes to education, lack of knowledge and resources, but also that "*parents think that children won't be able to use the toilets at school*".

Although past water and education programmes have addressed water supply, trained artisans, provided hygiene training and classrooms, few programmes have addressed school sanitation. She advised that the National Sanitation and Hygiene Policy was due to be endorsed by August 2011, but that to date there is still no National SWASH programme although a number of donors are interested.

WM explained that the original draft SWASH Strategic Plan had been developed by Ministry of Health but that since the MoU between the four key ministries was signed, UNICEF is hoping for greater input from MoEVT. This was indicative of the difficulties coordinating WASH and SWASH in particular, and the problems of focussing attention on inclusive SWASH. She was not the only informant to identify that MoEVT Infrastructure Department would need to be better involved in future school sanitation designs as they will ultimately be responsible for implementation of NG SWASH.

4.8.7.6. ex-UNICEF WASH Specialist

SH confirmed that a School WASH network had been created to facilitate communication between the NG SWASH stakeholders but that not all stakeholders had fully engaged. Of particular concern is the infrastructure department of MoEVT who will ultimately take over the NG SWASH document and have to support its implementation.

4.8.7.7. SNV WASH Advisor

The WASH advisor has an environmental sciences background and therefore accessibility issues had been a new experience for her during the development of the NG SWASH. MM2 confirmed that

even if no disabled child was currently enrolled in the school receiving SNV support, accessible toilets would be provided as part of a total latrine block since it was not considered economic sense to build separate accessible toilets SNV are using interim student: latrine ratios of 80:1 (girls) and 100:1 (boys)

No new construction of school sanitation had yet been completed, however she said that some latrine rehabilitation schemes were ongoing and had faced a number difficulties due to inadequate information. Sanitation assessments mainly collected operational information rather than details which could enable design of safe and practical modifications for accessibility and SNV had encountered problems during implementation with many rehabilitation schemes looking unworkable.

4.8.7.8. Plan Tanzania -Water and Sanitation Advisor

FM explained that as Plan have a policy of inclusion he had sought out suitable designs for school sanitation and chosen to base Plan toilets on the design in “Sanitation for Primary Schools in Africa”, commonly referred to as the “WEDC design” (Reed, Shaw & Chatterton 2008). He made modifications to suit the project location and, having piloted it in 6 schools supported by Plan, he advocated for the design for other public schools by highlighting the benefits at the inauguration ceremony attended by the Kisarawe District Commissioner and District Executive Director. He said that schools chosen for new toilets were selected based on their current student: latrine ratios and that; as there can be “*no compromise when it comes to sanitation*”; they have used the 20:1/ 25:1 ratios. Schools identified as having high latrine ratios get a pair of toilet blocks with accessible features, but those with low ratios do not get any support. It was not clear whether Plan would provide support if disabled students were enrolled at the latter schools.

4.8.7.9. HakiElimu - Media Programme Manager

NS promotes human rights in the education system. He says that the lack of resources made available by the government to expand special schools means that mainstream schools need to be made accessible to be able to cater for the many disabled children in society, particularly the physically disabled. However he felt that visually or intellectually impaired students cannot be accommodated in mainstream schools.

He said that most schools do not have enough latrines and sometimes there are no toilets for teachers who then lock a student toilet for themselves. NS said “*the conditions are so bad, someone who is crawling is forced to move around in the dirt of everyone else. We were talking with parents and they were saying that it is better for the child to stay with me at home than go to school where there is no facility*”.

He said that as there is often no choice of facilities disabled children decide not to take food or water. He said that less than 1% of disabled children are in school and this is “*not because parents are ignorant, but because there are no facilities for disabled children*”.

NS said that the government talks about inclusive education but has done nothing to improve the situation, instead focussing only on existing inclusive schools. “*The government argues that they want disabled children to mingle with other students...but is not ensuring the quality of education, so we can't celebrate disabled children attending mainstream schools*”.

4.8.7.10. Group of visually impaired adults attending seminar at inclusive school

2 older men and a young woman with visual impairment who were previous students at a school being visited were interviewed whilst on a break from a seminar run by the Tanzania League for the

Blind. All had completed Primary School.

The men said that they had used the “new” school toilets (large tiled pour flush toilets) and that these are much better than the old VIP latrines as “*the buildings are bigger and the floor is better*”. The woman said the old latrine drop holes were wider and “*unsafe for small children*”. They all said the toilets were not slippery as the water drains to the pan. As with teacher RB the men used their foot to find the hole rather than their canes.

4.8.7.11. MoEVT Infrastructure Engineer

HK is an Engineer grade I. He said he had not been involved in the development of the NG SWASH but that someone from the Commissioner’s office, who was not an engineer, had come and chosen latrine drawings from the various standard drawings for inclusion in the draft NG SWASH.

When asked why school drawings did not show ramps he explained that these are usually instructed at site. The MoEVT has detailed specifications and BoQs for their designs which identify the exact nature of facilities to be provided. In addition the SEDP Technical Handbook provides guidance in Chapter 5 on physical standards for accessibility.

One of HK’s colleagues said that “*for the disabled, everything is expensive*”.

4.8.7.12. Lecturer in environmental management at Ardhi University

The lecturer who was also Dean of Students, a WEDC alumni and author of the 2010 WSSCC Sanitation Sector Status and Gap Analysis in Tanzania (Chaggu 2009) had been asked to visit school latrines being built in Serengeti District under an AmRef project. The designs were by AmRef and construction by local artisans. EC said that the construction was ongoing and that she had informed the local project officer of necessary changes to the designs as the ramps provided were not accessible even to able bodied people (Fig 4.10-5).

4.8.7.13. Private Sector Architect

DG is a foreign architect who has practiced in Tanzania for over 8 years. He was invited to comment on the CCBRT accessibility guidelines for disabled students and has provided recommendations on WB funded public buildings. He developed the accessibility Fact Sheets for CHAWATA under the government’s BEST –AC programme (CHAWATA 2008). However he was not involved in the dissemination and advocacy elements of these projects and did not know who the technical guidance had been shared with.

He said that the construction industry in Tanzania is heavily regulated and those people with understanding of accessibility issues are often not able to get involved in such work, leaving design to those with little knowledge.

DG said that technical guidelines documents which rely heavily on text are not easily understood and that drawings and visual representations are much more effective. He said that there is little understanding of the technical implications of accessibility and in general government designs are poor.

No agency is coordinating the issues relating to accessibility although there is cursory inclusion in the draft Buildings Bill, but that the agencies that check designs and issue building permits are only interested in land use issues and not accessibility.

He suggested that donors need to demand accessibility as part of their funding conditionalities.

4.9. Institutional environment for accessible sanitation

In order to understand the barriers to providing accessible infrastructure, in addition to greater awareness there is a need for enforceable regulations and technical standards. The information provided here is based on interviews with Key Informants and document review.

4.9.1. Legislation and regulations and current status

During the research it became clear that although Tanzania has a number of relevant acts and regulations (2.9.2) they are currently not working in harmony to create an enabling environment for disabled people and disabled children in particular. Very few people had knowledge of such regulations or saw the obligation within the 2004 NPD or the recent Disability Act to revise the building regulations

As outlined in Section 2.9.4.2, there is an opportunity to align the efforts of the various sectors to create clear guidance and robust legal backing for accessible infrastructure.

- National Policy on Disability (2004)– requires physical accessibility of public buildings and “*conducive environment for inclusive education*” but has no specific regulations, method of monitoring or enforcement
- MKUKUTA I (2005) – Objective for 100% adequate school sanitation does not consider Objective for 20% enrolment of disabled children in school by 2010. Monitoring and reporting on these two goals in BEST 2010 was absent
- National Sanitation and Hygiene Strategy (draft 2010) – does not identify needs of disabled students in designs
- National Strategy on Inclusive Education (2009-2017) - Strategy 1.3 proposes funding and “*incentives for barrier free school construction*”, including latrines, but this suggests it is optional rather than integral

The draft Buildings Bill is still thought to be far from prescriptive enough to aid designers and builders although this is a requirement of UN 1993 Standard Rules on Equalisation of Opportunities for People with Disability (Boon 2011, Gummich 2011).

4.9.2. Existing design standards

Further to 2.9.4.3, the current technical standards have the following limitations:

- MoEVT Infrastructure - SEDP Technical Handbook+ standard drawings, though some latrine designs do not comply with the handbook requirements
- Draft NG SWASH – some conflicting criteria, some undefined criteria.
- CHAWATA/ BEST-AC Factsheets “Disability not Inability” - not SWASH specific

It is clear that the approach used at school S4 to develop their design as well as lesson learnt from its use would be beneficial to other schools and municipal education engineers.

Similarly, the WEDC based design used by Plan Tanzania and the modified version which is included in the NG SWASH provide a basis for further discussion and alignment to suit the needs of Tanzanian Primary schools.

EEPCO designs constructed to date are for accessible cubicles only, and whilst this might be appropriate in some situations, the concept of universal design suggests that designs which integrate accessible cubicles into complete latrine blocks are the ones to focus on.

4.9.3. Donors and NGO designs

The researcher was made aware that NGOs including Concern, ActionAid and Amref are providing school infrastructure, some of whom employ Ardhi University to assist with construction monitoring.

As noted in 2.2.7 donors such as DFID and World Bank claim that they include disability issues within their programme designs.

Unfortunately this approach does not seem to have filtered down to the implementing agencies which their funding supports.

The CCBRT initiatives to make schools accessible are supported by AusAid who promote disability inclusion in their programmes (UNICEF et al n.d.).

Irish Aid support both CCBRT and WaterAid Tanzania and conducted training on accessibility at CCBRT during the field research period.

Concern and AmRef supported latrines visited by Ardhi University and facilities previously provided by Plan Tanzania had failed to include accessibility measures and one example of ActionAid supported classrooms visited had no accessibility features (Fig 4-40).

Collaboration with these agencies on barrier free schools seems essential in that they appear to be using their own designs rather than using MoEVT standards.

Figure 4-40: donor funded school buildings



4.10. Costs of inclusive sanitation

4.10.1. Extra construction cost of accessible sanitation

Cost estimates in Tanzanian Shillings based on the NG SWASH designs were produced by the researcher. This section presents the findings based on the assumptions outlined for each design in Appendix 8.5.1, 8.5.2, and 8.5.3 respectively.

Some of the more significant assumptions are noted here:

- As BoQ rates were not available for plumbing, sanitaryware or drainage items the researcher has adjusted designs to assume pit latrines and no costs for handwashing facilities are included, e.g. water tanks, washbasins. (Appendix 8.6)
- All pits are assumed to be 3m deep and fully lined.
- Many drawings did not specify floor or wall finishes therefore, since the researcher was advised that screeds are normally provided, basic finishes have been priced.
- The EEPKO and MoEVT designs do not include seats but blockwork seats with wooden tops as per the WEDC design have been included in the respective cost estimates
- Where door and window dimensions are not clearly indicated on drawings they are assumed to be timber framed 0.8x2m doors and 0.6x0.5m windows.
- All structural (suspended slabs, beams and lintels) concrete is assumed to be C20 reinforced.
- Ground bearing concrete is assumed as C15. Main latrine slabs are assumed to be reinforced with mesh.
- Handrails are assumed to be bent pipe sections to create single lengths of straight handrail

rather than the bespoke handrails shown on drawings

4.10.1.1. Modified WEDC design

Fig 4-41 shows the breakdown of the costs of a whole block including the accessible cubicle to identify where the main costs lie. As expected the majority of the “extra” cost is due to the larger cubicle (1.5x1.5m) which includes the handrails and seat as compared to the 3 standard cubicles of 1.5x1.2m without seats or handrails.

Figure 4-41: Cost breakdown modified WEDC

Components	Cost (TSh)	A - cubicles	B - corridor	C - urinal	D - water jar slab	E - privacy wall	F – steps/ramp	Σ
Standard	6,696,139	47%	4%	13%	1%	7%	1%	73%
Accessible	2,529,837	22%	2%	0%	0%	2%	2%	27%
Total latrine	9,225,976	70%	5%	13%	1%	9%	3%	

The researcher has assumed that the internal dimensions are controlling where dimensional errors occur on the modified WEDC drawing in the NG SWASH and external dimensions have been adjusted to suit. No roof details are shown on the drawing so the design has been assumed to be as that of a similar SEDP toilet block for pricing (Appendix 8.8).

4.10.1.2. MoEVT Design

Only one of the MoEVT designs in NG SWASH has provision for accessibility, but it is for a hostel latrine block containing showers and laundry facilities. Therefore the researcher selected a design from the SEDP Standard Drawings which is more appropriate for a non-residential primary school (drawings SDP/11AD/01 to 04). However this design is for pour flush and provides only 1 unisex accessible cubicle. As the study was unable to acquire BoQ rates for plumbing and sanitary ware the estimate assumes that it is a pit latrine and that 2 accessible cubicles are provided to be culturally acceptable.

Figure 4-42: Cost breakdown modified MoEVT

Components	Cost (TSh)	A - cubicles	B - corridor	C - urinal	D - water jar slab	E - privacy wall	F – steps/ramp	Σ
Standard	11,268,450	50%	6%	0%	0%	24%	0%	80%
Accessible	2,845,972	15%	1%	0%	0%	2%	2%	20%
Total latrine	14,114,421	65%	7%	0%	0%	26%	2%	

As for the other designs the cost of the cubicle is the greatest proportion of both the standard and accessible element costs (Fig 4-42). The accessible cubicle is 2.55x1.65m as opposed to 5 standard cubicles of 1.5x0.95m (Appendix 8.5.2). The main block uses a “dog leg” to provide privacy and therefore the cost of wall component is high. The slabs are only 1 brickwork course above EGL (150mm) and therefore no steps would have been provided in lieu of the ramp.

4.10.1.3. EEPCO design

Due to the double vault design all cubicles in this layout are large, the accessible cubicle is 2x2.5m whilst the standard cubicles vary in size but are approximately 2x1.5m (Appendix 8.5.3).

The slab is 540mm above EGL which results in a very long ramp and 4 steps. The ramp has a kerb and handrail for it’s full length on one side which makes a significant difference between ramp and steps cost components (Fig 4-43)

Figure 4-43: Cost breakdown EEPKO Double Vault

Components	Cost (TSh)	A - cubicles	B - corridor	C - urinal	D - water jar slab	E - privacy wall	F – steps/ramp	Σ
Standard	9,945,282	55%	5%	0%	7%	0%	1%	67%
Accessible	4,825,039	21%	1%	0%	0%	2%	8%	33%
Total latrine	14,770,321	76%	6%	0%	7%	2%	9%	

4.10.1.4. Comparison

The cost of the accessible components as a function of a whole latrine block ranges from 20-33% (Fig 4-44) in comparison to the literature estimates of 0.61-7.5%. The extra cost of “accessible components” as a proportion of the “standard components” ranges from 3.3-18.8%. The principle reasons for this difference were outlined in 2.11.3.

An alternative comparison is provided in Appendix 8.7 which includes a rough assessment of equivalent cost if each latrine block design was not accessible, i.e. replacing accessible components with standard components. However this approach is not entirely accurate since the cost of communal areas cannot simply be increased pro rata, but it gives an indication of the equivalent ‘non-accessible’ block cost.

Figure 4-44: Comparison of costs

Design		Standard components	Accessible components	"(extra) cost"/ total cost
WEDC (NG SWASH)	no. cubicles	3	1	
Cement Blocks -fully lined, boys	cubicle floor area	1.80	2.25	
	total cost	6,696,139	2,953,745	31% (1)
TK 2:2 p28/29,32,34	cost per cubicle	2,232,046	2,529,837	113% (2)
	cost per m2	1,240,026	1,124,372	91% (2)
MoEVT SEDP Drgs	no. cubicles	5	1	
SDP/11AD/01-04	cubicle floor area	1.43	4.21	
	total cost	22,536,899	5,691,943	20% (1)
	cost per cubicle	4,507,380	5,691,943	126% (2)
	cost per m2	3,163,074	1,352,809	43% (2)
EEPKO (NG SWASH)	no. cubicles	4	1	
Double Vault Girls	cubicle floor area	2.82	5.00	
DVVIP1 TK 2:2 p61-67	total cost	9,945,282	4,825,039	33% (1)
	cost per cubicle	2,486,320	4,825,039	194% (2)
	cost per m2	881,674	965,008	109% (2)
(1) cost of accessibility/ cost of whole latrine		average	cost per cubicle	145%
(2) cost of accessible/ cost of standard			cost per m2	81%

However, as stated in 2.11.4 of the literature review, the difference in the total number of cubicles and other “standard” components makes it inappropriate to compare the “extra costs of accessibility” in this way. Therefore the cost per cubicle and the cost/m2 have also been calculated

This finds that the extra cost/m2 varies from 43-109% due to the varying range and standard of accessibility features included, e.g. ramp kerbs and handrails. The WEDC and MoEVT accessible cubicles have lower cost/m2 than the standard as the cost of accessibility features is spread over the larger cubicle area. The EEPKO cost/m2 is higher as seats and handrails for both dropholes have been priced in the accessible cubicle.

The extra cost/cubicle ranges from 113-194% due to the extent of accessibility features provided

e.g. seats, handrails as well as the larger plan area which increases pit, slab and roof costs. Note though, as stated in 2.11.3, that for pit latrines where the pit walls often align with the upper walls, this means that accessible cubicle will have a larger pit and therefore a longer life span.

4.10.2. Reliability of costs

As noted at the start of 3.10, the level of reliability of the cost estimates is hard to define. The nature of the exercise requires numerous assumptions due to this being a theoretical exercise and due to some limitations in BoQ rate information.

Materials quantities take-offs from first principles have been carried out to a level of accuracy necessary to identify the costs of accessibility components and is not reliant on secondary data. The representativeness of the BoQ rates applied is dependant on how many sources each rate was based on, and gives equal weighting to each source which may not be correct (Appendix 8.6).

4.10.3. Triangulation

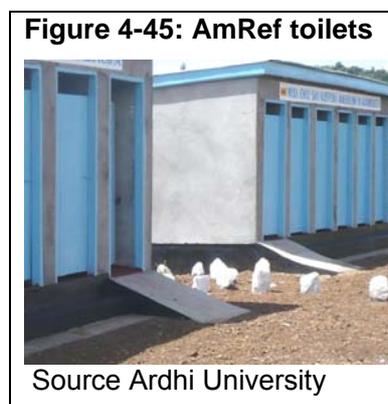
It was not possible to check any of the cost estimates against independent data for the reasons given in 3.10.5.1 and 3.10.2, and the gaps in data noted in 3.13.5. The main cause is assumed to be the commercial nature of the information making people unwilling to share documents.

4.10.4. Responsibility and resources

Having determined the “extra cost” of accessibility, the issue of resource mobilisation arises. The following section briefly outlines the current sources of support and funds accessed by the schools visited.

4.10.4.1. Responsibility for provision (i.e. planning, funding, construction)

- Municipality – All public schools agreed that primary responsibility for provision of sanitation lies with the local government authority. However all schools also agreed that the 20% of the Capitation Fund assigned for Infrastructure Maintenance & Minor repairs is inadequate for both new or rehabilitation works. Failed designs at 3 schools were noted where school management had not been involved in the procurement process.
- Private sector - Schools reported making applications to private companies via the relevant school authorities. In these cases it seems this bureaucratic procedure to access private funding is a barriers to mobilising resources (4.8.7.3).
- NGOs/ DPOs - Of the schools visited, toilets had been constructed or renovated by AmRef, Plan Tanzania, CCBRT and WaterAid. Two of these facilities had no accessibility features (Fig 4-45).
- Private Individuals - For the non-government schools, private donors and churches were reported to be the main source of funds for all infrastructure investments
- Community - At the rural schools most latrines had been constructed with the help of the community, either in collection or purchase of materials as well as unpaid labour to assist paid artisans.



5. Discussion

This section discusses the significance of the findings and highlights some the key issues relevant to each element of the research objectives. To supplement the suggestions, reference to relevant literature has been made.

5.1. Good Practice Accessible School Sanitation

Objective 1: Assess the benefits of both “accessibility features” and “good practice watsan” features of school sanitation for students with different impairments

This section will discuss the key aspects of accessibility features which facilitate independent use by disabled students in turn, and identify those which benefit particular disability types and possible conflicting preferences.

5.1.1. Assessing accessibility features

5.1.1.1. Distance and route from classrooms

The condition of school grounds and routes to latrines are difficult to control, but distance barriers to latrine use can be managed by thoughtful siting of latrines (David 2008:6, Adams et al 2009:33, Jones 2011). For urban schools with limited space, choice of latrine location is likely to be more constrained, but distance should be less of an issue but the location of surface water drainage features can pose barriers instead (WaterAid Mali 2007:4, Horne & Debeaudrap 2007:22)

5.1.1.2. Ramps

Ramps are critical for wheelchair users and aid other students with physical or visual impairments. It is important that common sense is used when planning the overall layout to prevent ramps becoming redundant as outlined in 4.1.2.2 (UNICEF et al 2004). Correct construction of ramp slopes can be aided with the use of a wooden template (camber board) to guide builders and supervisors. Where ramps of 1:20 cannot be provided due to lack of space, then steeper ramps can be considered if handrails are also provided (Jones & Reed 2003:10). Non-slippery materials should be used, therefore wood and earth are not advisable

5.1.1.3. Access within latrines

Wider doors, corridors and cubicles and the removal of steps are critical if wheelchair users are to avoid crawling on dirty floors.

Steps

Steps of any size are a barrier to wheelchair users but uneven steps also make access difficult for the visually or other physically impaired student as well as small children as noted in 4.1.2.2. Most steps can be removed by thoughtful design and construction but where unavoidable they should be regular and within the compliance criteria (Jones & Reed 2005:51, Handicap International 2009).

Landings & corridors

4.1.2.2 outlined some of the access difficulties associated with landings and corridors. They should be of sufficient width ($\geq 1.2\text{m}$) to allow wheelchair access, accounting for direction of door opening and spacious enough to allow for storage of materials as well as disability aids (Jones & Reed 2003:12, Chambers 2005:64). As for ramps they should be of a washable material to allow cleaning and prevent erosion with appropriate drainage points, ideally to the dropholes.

Where subsidence is likely they should be reinforced and measures to address damaged slabs must

not cause further access problems in themselves (Rukunga et al 2006:4)

In addition to improved physical access, wider corridors allow more light, particularly if not roofed, helping both visually and physically impaired students and likely to result in better cleaning (Mooijman et al 2009:190-191).

Doorways & Doors

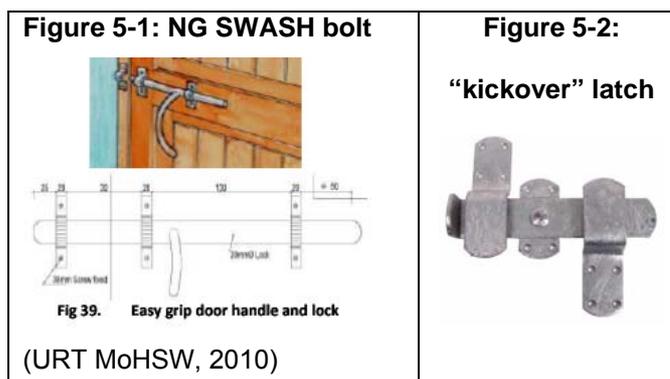
Narrow doorways and corridors within latrine blocks can make even from the most user-friendly latrine inaccessible (Fig 4-4). Doors and door fittings need to be robust to withstand regular use by children.

The actual size of wheelchairs in use should be checked before design and construction but small children may struggle to manoeuvre if landing or corridor space is inadequate even if 800mm width is provided.

Outward opening doors are preferable to allow “space” inside, but doorstops or wide internal handrails are recommended to aid closure (Jones & Reed 2003:10, UNICEF et al 2004), but inward opening doors can be used if double leafed (Jones & Reed 2005:59). Alternative layouts could be trialled to provide privacy without doors e.g. large “G” spirals (4.1.3), eliminating difficulties with locks, handles and door hinges if security can be assured (Jones & Reed 2005:60)

5.1.1.4. Handles and Locks

The NG SWASH provides an indicative style of lock for use but it is not a design that is readily available on the market and does not state a minimum dimension for the “handle” component (Fig 5-1). A ‘kickover’ style latch does not require grip and can be made locally from timber or metal (Fig 5-2)



All handles and locks, including padlocks, need to be of a size and design enabling unaided use by a disabled child (Jones & Reed 2003:10, Chambers 2005:63, Ahmed et al 2011:3). All handles and locks need to be appropriately located to be reached unaided by disabled students, including those who crawl (Chambers 2005:62, Jones 2011:2) (Fig 4-7)

Where toilets are constructed without the input of a disabled person, only clear guidance on standard drawings and specifications can overcome low awareness of designers, supervisors and contractors.

5.1.1.5. Cubicle size

Although obviously one of the main causes of “extra cost”, SNV’s experiences of trying to retrospectively provide accessibility suggests that failure to provide minimum cubicle sizes from the outset is difficult and expensive to overcome since latrine walls are usually all load bearing (2.10.4, 2.11.1, 4.8.7.7).

Finalisation of accessible cubicle size has to consider normal latrine use and disability aids so that layouts maintain space for storage of temporary seats, water buckets etc (UNICEF et al 2004, Jones & Reed 2003:11,12, Jones & Reed 2005:60, Shrestha 2006:6)

Provision for side rather than front transfer avoids children having to reverse out of cubicles (Jones & Reed 2003:12, Jones & Reed 2005:62) (4.1.2.4)

5.1.1.6. Handrails

No disabled student interviewed had a preference about height and orientation of handrails, however the literature suggests that horizontal or inclined handrails are the most helpful and can also be used to manage clothing (UNICEF et al 2004). External handrails help disabled children negotiate steps and ramps unaided.

Large cubicles need handrails as children cannot use the walls for support (WaterAid Mali 2007)

Wall mounted handrails are preferable since they maintain cubicle space and use of local materials and fixing details can reduce costs and aid replacement and therefore sustainability (4.1.2.5) (NCPD & WaterAid Ghana 2010:13, David 2008:8, Jones & Reed 2005:107).

Inclined rather than horizontal handrails can enable use by a range of ages (Chambers 2005:62).

5.1.1.7. Seats

Despite cultural perceptions of uncleanliness by non-users (Jones & Reed 2005:108) seats were found to be helpful for physically, intellectually and visually disabled students although for differing reasons (4.1.2.6) (Chambers 2005:62). The presence of a raised seat or pour flush pan appears to override fears about falling in the hole that exist with drophole latrines despite pedestal seat openings being large (Shrestha 2006:6).

Cleanliness of seats is a concern to all children therefore the use of suitable materials is important for hygienic use. As noted in 4.1.2.6 designs need to address the issue of splashing or fouling which does not seem to have been sufficiently investigated so far and further design trials may be advisable (Jones & Reed 2003:12, Russell 2007:101). Therefore, as with cubicle size, it is likely that different sized seats should be designed to cater for both small and older children (Adams et al. 2009:32).

The size of openings should suit the physical and intellectual age of the children using it (Mooijman et al 2009:195). “Keyhole” shaped openings are more difficult and costly to form and can be replaced with circular or trapezoidal shapes.

Temporary seats were common, but their stability over tiled floors or ceramic squat pans are present was not proven. In addition the stability of plastic chairs with holes cut in them remains uncertain in the long term (Box 5.2).

Box 5.1: The handrail that didn't help

The floor mounted handrail fitted retrospectively in S1 had narrowed the width of the cubicle and made it difficult for even an adult wheelchair user to turn around.

As noted in 4.4.1 and 5.1.4.2, the involvement of disabled people is critical to effective design and implementation (Wiman & Sandhu 2004:25)



Box 5.2: Hole size and shape

Particularly for plastic seats, it is important not to cut too large a hole or the chair loses rigidity, although some designs had used wood to try and stiffen the chair legs



The use of two stacked seats may provide better stability, and can be separated for easy cleaning.

5.1.1.8. Windows and Light levels

Darkness was only mentioned as a problem at one school, but observed latrine cleanliness and hasty use by students indicates that lack of light negatively affects user behaviour and latrine maintenance (Chambers 2005:63). It is clear that the size and position of windows is no indicator for the amount of light inside a structure. Therefore how to ensure light levels during design and construction is not resolved. A minimum lighting compliance criteria should be defined together with a pragmatic method of measurement (4.1.2.7)

Concerns about loss of privacy due to windows can be overcome by locating them at high level, or providing many small openings rather than large ones (Jones & Reed 2005:60).

5.1.1.9. Tactile surfaces, colour contrast and signage

4.1.2.8 notes that no examples of tactile surface or signage were found and therefore no indications of preference were made by any interviewee. Instead physical markers e.g. raised seats, handrails sufficiently aided visually impaired students locate dropholes (Chambers 2005: 63)

However large physical markers may form trip hazards for physically disabled students and may prevent use or cause injury (WaterAid Mali 2007:4, Jones & Reed 2005:61)

Introducing signage (symbols, text and braille) on accessible facilities as part of ongoing accessibility activities would raise awareness of disability and the possibility of disabled children's attendance at mainstream schools

5.1.2. Good practice sanitation features

5.1.2.1. Water

To avoid duplication of discussion about water features, supply for all uses is covered in Section 5.1.3

5.1.2.2. Washable slabs and drainage

The ability to drain all surfaces within the latrine block helps to prevent latrines becoming muddy, slimy or slippery which can cause difficulties for physically disabled users and can lead to unhygienic conditions (Horne & Debeaudrap 2007:22). As noted in 4.1.2.2 and 4.2.2.2 slabs made from earth or mud suffered from erosion as well as not being washable.

Unless slabs are sloped and drain to a suitable locations, the ability to wash the slab alone does not achieve the desired aim of keeping the latrine clean and dry. Hence minimum falls of slabs and screeds is suggested and should be clearly stated on drawings and guidelines rather than left to the contractor's discretion and experience (4.2.5) as well as weepholes of suitable diameter to prevent blockage need to be provided to a suitable location.

Backfill to areas where drainage leads must be of a suitable material to prevent water logging or subsidence (4.2.2.2, 4.4.4) which was observed at a number of latrines.

5.1.2.3. Drophole covers

The effectiveness of drophole covers is unclear where pits have not been designed as VIP latrines (4.2.2.3), and may contribute to further hygiene problems if handwashing is not possible in the cubicle. Drophole covers are a further barrier for some disabled students who may be unable to remove them without assistance, particularly if temporary seats are in place. Therefore where latrines are true VIPs, covers should be of a light material and easy to clean, e.g. wood not concrete or steel.

5.1.2.4. Location and type of cleansing agents

The presence and proximity of cleansing materials reinforces hygiene education and may improve the attitudes towards use and cleaning of latrines (Mooijman et al 2009:193). Any activity which improves cleanliness could improve accessibility for disabled students.

Intermittent or non-existent supplies greatly affect the use of water use for personal cleansing, particularly where other uses take priority (EENET 2010:13). The development of low maintenance rain water harvesting systems for handwashing seems appropriate in light of all the difficulties with piped supplies.

Water and soap needs to be available near the latrines, preferably within reach of the toilet seat so cleaning can be done before getting back in a wheelchair or using other aids (Jones & Reed 2003:13). Where water is not available, formal storage of other cleansing materials is recommended, in locations where it will not get wet or contaminated.

Hygiene education needs to be formalised and reinforced by child to child or health service activities, not the other way around.

5.1.2.5. Security of latrines

4.2.25 identified poor cleanliness and theft of fixtures as some of the impacts of poor security on disabled students. Where community use cannot be controlled, security of latrines used by disabled children seems advisable together with raising awareness within the community of using facilities responsibly. Ultimately poor use by outsiders is due to lack of facilities for their use and must be considered preferable to open defecation on school grounds.

Selection and installation of fittings that cannot be removed is easily done, e.g. spot welding of tap fittings.

5.1.2.6. Cleanliness

Lack of cleanliness not only discourages students from using latrines due to health and safety fears but due to loss of dignity if they and their clothes get soiled with limited ability to wash themselves privately (Jones & Reed 2005:101, Collender et al 2011:5).

Wheelchair users who require others to push them suggested they would prefer to use a clean toilet independently, by crawling (4.7.1.8).

The factors affecting cleanliness were not specifically investigated during this study although the findings suggests that school population, student: latrine ratios, cubicle size and light, water availability and whether the school is urban or rural all play a role (see 5.1.2.8 below).

The management of latrine cleaning is another key factor, which is usually left to students though disabled students are usually excluded which may cause resentment amongst other children (4.2.2.6) (UNICEF et al 2004:2, EENET 2010:10)

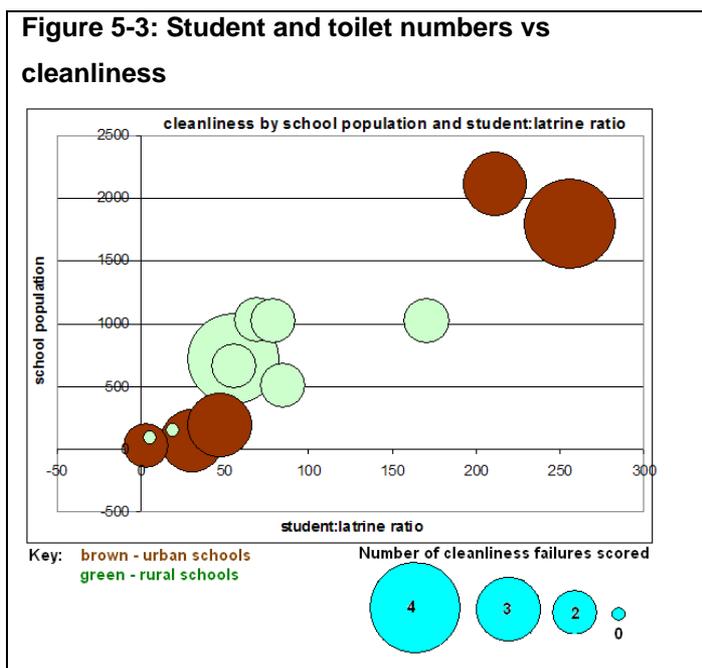
5.1.2.7. Menstrual Hygiene Facilities

Menstrual hygiene bins or rooms were mostly absent. The one school with a bin had it “tucked away” in a location which restricts use by disabled students. If only one menstrual hygiene facility is provided, then it needs to be accessible to all girls.

Accessible and safe final disposal methods are also needed which are usable by all disabled students, together with washing facilities required where cloths are being used

5.1.2.8. Student: latrine ratio

An inverse relationship was expected between student: latrine ratios and cleanliness (4.7.1.7) (UNICEF Sri Lanka 2009:14).



Plotting school population against student: latrine ratio produces Fig 5-3, where the number of cleanliness problems, as recorded during the accessibility audit, is depicted by the size of the bubble. The chart shows that student: latrine ratios tend to increase in line with school population, i.e. schools provide similar numbers of latrines regardless of school size. However for rural schools although school size increased, there was some clustering of student: latrine ratios.

This suggests that urban school cleanliness is more affected by high student ratios than at rural schools. In some senses this is unexpected since urban schools are more likely to have water, but this could be a reflection of a lower sense of community responsibility amongst users at urban schools (4.1.2.1).

Due to the importance of cleanliness for disabled students every effort needs to be made to reduce student: latrine ratios since there is a negative impact on cleanliness. Cleanliness in urban schools requires particular attention, regardless of population. More options for emptying of toilets are required rather than abandoning and building new ones, to incrementally improve student: latrine ratios (3.16).

5.1.3. Good practice water supply features

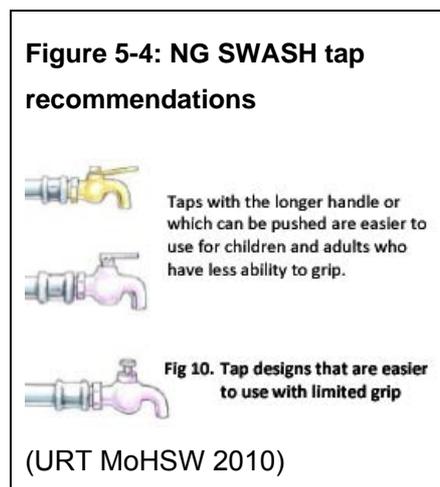
Various literature emphasised the importance of water or other cleansing materials being close to latrines to facilitate handwashing after latrine use. For physically disabled students, having to carry water to the latrine is a barrier to their use (Ahmed et al. 2011). Factors that influence use include distance from the latrines as well as surety of water supply. To further improve health benefits, soap needs to be available.

5.1.3.1. Number and type of taps

The result of insufficient taps includes damage to taps, water logging and ponding due to congestion. A shortage of taps is clearly a disadvantage to disabled students who have to compete with other students to use them (EENET 2010:22).

The NG SWASH target student: tap should be included in the assessment checklist to ensure adequate access to all students during peak demand (2.10.1).

At least one tap should be a type which enable use without gripping (Fig 5-4) and minimum handle lengths for the lever type



tap to be specified, 100-150mm suggested

Tap arrangements and fitting to be suitably sturdy to cope with concentrated use during breaks.

Varying tap heights might be appropriate (Government of India & UNICEF 2008:22).

5.1.3.2. Aprons and drainage

The presence or absence of aprons and drains also hampered access as mentioned in 4.3.2.2.. Issues similar to those mentioned in 5.1.1.1 apply. With regard to access for disabled children designs of drains and aprons should be as barrier-free as possible, e.g. providing level access to a sloped apron with upstands at the low point only, and cover slabs over sections of drains to enable crossing. The general absence of effective aprons and drains resulted in health hazards at most schools and needs to be addressed as part of wider WASH activities.

5.1.3.3. Distance and accessibility

Taps located far from toilets are less likely to be used. Lack of water in latrines can discourage disabled children's use of school toilets (UNICEF et al 2004:2). Recommended maximum distance for handwashing water vary greatly in the literature as did other relevant compliance criteria (Fig 2-17). Further discussion and greater detail on appropriate compliance criteria for water supply, number of taps, volume of water/child/day, distance from latrines, etc is needed.

With specific reference to disabled children handwashing water is required within accessible cubicles to enable cleaning before transfer to wheelchairs or use of callipers, crutches or canes. It should be at heights and arrangements that can be used by all students, i.e. tippy taps need adjustment for use by disabled children

5.1.3.4. Water sources and storage

The lack of water at schools particularly affects disabled children's health as well as hygiene behaviour and undermines their ability to learn, in addition to the physical and psychological pressures of being required to bring water from home (EENET 2010:13,17).

Further investigation of sustainable rain water harvesting systems as stated in 5.1.2.4 is suggested considering Tanzania's well defined rainy season (4.3.2.5) to reduce reliance on piped supply with intermittent flow or insufficient pressure.

Provision of secure safe water storage at school may be useful when disabled children have difficulty bringing water from home.

5.1.4. Problems of implementation – design or construction?

Even where present, the implementation of accessibility features often renders them inappropriate (4.4.1). Since the research did not have access to any original designs or personnel involved in original construction, it is not possible to accurately assign the cause to either the design or construction. But it became clear that through poor detailing, supervision, workmanship and materials quality many basic features were not achieving their intended purpose (Jones 2011:2, Boon 2011, Gummich 2011, Mkumbwa 2011)

5.1.4.1. Awareness

4.8.1 identified that many adults had little idea how disabled children coped with inaccessible school toilets. Lack of interest or awareness meant that problems children had using school latrines were not recognised (Jones & Reed 2005:35)

5.1.4.2. Access to technical advice on accessibility

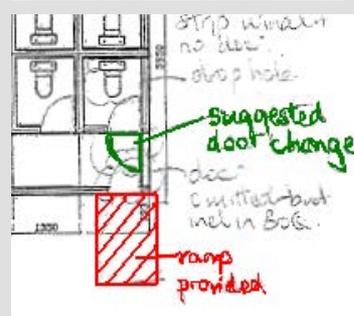
Only schools who had received recent NGO assistance had incorporated accessibility into their designs. Knowledge of sources of advice could not be identified by any school interviewee (4.4.2). The lack of knowledge about where to access technical advice on disability issues is reported in practitioner literature from many countries (Rukunga et al 2006; NCPD & WaterAid Ghana 2010)

Box 5.3: Small changes can make a difference

School S9 was in the process of constructing a new toilet block and the Head Teacher had already requested the construction of ramps to aid accessibility. The ramps were of acceptable gradient but the doorways and corridor were narrow.

As all doors were inward opening, even though only dropholes were provided, once standing inside a user would have been in the way of the closing door.

Therefore it was suggested that the door of the cubicle in front of the ramp be re-hung opening outwards, since it was the only cubicle accessible by wheelchair due to the narrow corridor. This would provide a wheelchair user greater chance of entering, though the problems of transfer and squatting remains.

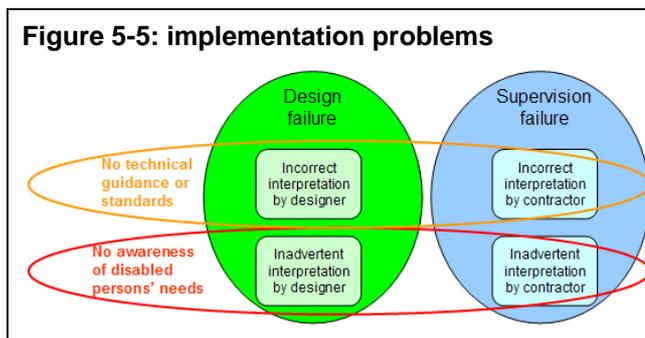


Access to both accessibility and sanitation technical advice is needed, particularly for schools and municipal engineers who develop plans and cost estimates for approval. If designs do not include accessibility at this stage it is difficult to add them afterwards due to cost and buildability.

There is an opportunity to incorporate the lessons learnt from schools S4, S16 and S18 together with current SEDP Technical Handbook guidance in the finalisation of the NG SWASH. Any resulting guidelines need to be actively disseminated rather than passively. Currently experience and knowledge is confined to a small number of institutions and their lessons learnt are not being shared but repeated (Jones & Reed 2003:19).

5.1.4.3. Implementation of accessibility features

Various examples of implementation errors were outlined in 4.4 and fall into two basic categories (Fig 5-5). Failure to understand the purpose of technical standards and guidelines results in inappropriate design whilst failure to follow the design, either accidentally or purposely, leads to inappropriate construction.



Poor attention to design detailing and supervision is a common problem in many LIC's (4.8.7.2, 4.8.7.13), especially where clients have little experience, e.g. schools building one off toilet blocks. Small projects attract small contractors and artisans, who often have little training or are unable to read engineering drawings and therefore construct latrines in line with traditional methods and designs (Fig 4-45).

Awareness raising on sources of advice and examples of accessible design are required. MoEVT is the logical choice as the focus for handling enquiries, supported by the NG SWASH partners in sensitising district education engineers.

NGO sanitation programmes have an opportunity to transfer lessons learnt to each school and to artisans and contractors (UNICEF et al 2010). This requires supervision staff to have knowledge of both good practice contract management and accessibility issues as well as adequate time and transportation to ensure incorrect works are rectified in good time.

Communication of technical requirements needs to be appropriate to the audience. Guideline documents should minimise written specifications and maximise the use of isometric sketches, drawings and photographs (Jones & Reed 2003:16, Mooijman et al 2009:195) whilst dissemination activities can use models and videos (Sinha et al 2006:539)

Use of practical methods to ensure maximum gradients on ramps, maintaining clear internal sizes of cubicles, landings and doors, or maximum sizes of drop hole openings during construction are needed, such as camber boards or wooden templates.

5.1.4.4. Implementation of good practice sanitation and water facilities

Observation of poor quality workmanship or materials added to difficulties in successfully using such facilities (4.4.3). Disabled students are more likely to be affected by overused and dirty latrines when some cubicles become blocked.

Construction specifications need to be developed, disseminated and enforced with specifications appropriate to materials available on the market (NCPD & WaterAid Ghana 2010:13).

Standard pit designs need to include porous linings, to support excavations but not build up water pressures and those designing and building latrines need better understanding of the effect of ground conditions.

The rehabilitation element of the capitation grant should be adequate to pay for regular maintenance and repairs, including emptying.

5.1.5. School grounds and other buildings

Since the elements of the findings reported in 4.5 that relate specifically to sanitation have already been addressed in 5.1.2.1, they will not be discussed again here.

It is obvious however that accessible school sanitation in an inaccessible school will not facilitate disabled children's attendance.

5.1.6. Identifying critical accessibility features

The findings suggest that the critical accessibility feature is in fact a good practice sanitation feature, i.e. cleanliness. Size and lighting levels contribute to cleanliness more than any other accessibility feature. Student: latrine levels also played a role in urban schools as shown in 5.1.2.8. In line with the importance of cleanliness, water was the next most critical sanitation feature desired by disabled students.

However cleanliness is greatly reliant on behaviour change and therefore other efforts are needed to facilitate its achievement. Those accessibility features which cannot be retrospectively altered are the most critical (Jones 2011), e.g. corridor and cubicle size, doorway widths which aid cleaning and correct use (Mooijman et al 2009).

There is insufficient evidence to claim that handrails or seats make a significant difference to

disabled users except intellectually impaired students as so few children had experience of using them and cultural perceptions of unclean seats overrode consideration of the benefits.

Ramps are clearly a major benefit to wheelchair users and others with physical or visual impairments, but since in theory they can be added retrospectively (Jones 2011), the researcher is uncertain how critical they are. Conversely the fact that until the ramp is provided the latrines remain inaccessible and the few wooden ramps observed were steep, slippery and lacking edge protection suggesting retrospective ramps tend not to be satisfactory. Therefore two main principles seem to apply:

- ✓ Features which cannot be easily or cheaply added retrospectively should be provided
- ✓ Features that aid access of all children should be included – size, light, water

5.1.7. Who to design for?

Although schools need to provide for as many students as possible, the findings suggest that physically impaired students are much more easily absorbed into mainstream schools than those with intellectual, hearing/ speech or visual impairments due to the different teaching methods and materials required for latter groups of children (4.6.2.1, 4.8.7.9). Therefore with regard to sanitation accessibility features, it seems appropriate that disabled toilets should be designed for access by wheelchair users.

The literature review found that the estimate of disability in the whole population at 7.8% (2.2.4.2). Even reducing this to 5% for the primary school aged population (URT MoEVT 2011: 9), using the 2010 population of 43M (Chuwa:5) gives 2.2M disabled children

Using a very rough and ready approach, we could assume that the number of special schools does not increase significantly in the coming years due to URTs focus on inclusive education (2.6.2), therefore only 0.6% or less would have access to special school (URT NBS 2008:97) and would cater for students with the most severe disabilities, a negligible number. 2.2.5 found that estimates of the spread of disability type for this age group varied. However considering that the physically disabled group are most easily absorbed into mainstream education without further teacher training and specialist teaching materials, this indicates that accessible sanitation for at least 0.8M physically disabled children should be planned for (Fig 5-7)

Figure 5-6: Estimated population of primary school aged children by disability type

NDS 2008	physical	albino+vis imp	hearing+ communication	cognition+self care	
BEST 2010	mobility	seeing	deaf+deaf/ blind	mentally+ autism	multit-impaired/ others
Range %	25-38%	11-32%	17-84%	21-58%	11%
Pop estimate (mill)	0.5-0.8	0.2-0.7	0.4-1.8	0.4-1.2	0.2

5.1.8. Identifying features beneficial to students with different impairments

Hearing and speech impairments had no effect on the ability of a student to use the latrine (UNICEF et al 2004:2) (4.6.2.1) therefore this section will concentrate on the benefits to other types of disability.

The issue of cleanliness was key to both physically disabled and visually impaired students as was the availability of water for both personal and latrine cleaning (4.7.1.4, 4.7.1.6).

Larger cubicles aided physically and intellectually impaired students by providing space to

manoeuvre or for someone to assist them, but it can also increase lighting levels (4.7.16) aiding user access but may also improve cleaning of toilets.

Seats were found useful by physically and intellectually impaired students though the reasons differ. Fig 5-7 summarises the benefits of each feature for the respective disability types as found by the study. Obviously the same cannot be assumed for all disabled children since the nature and severity of their disabilities varies. In addition, some preferences related strongly to cleanliness of the feature or perceptions of dirtiness in the experiences of the user rather than under ideal sanitation conditions.

Figure 5-7: Benefits of accessibility features by disability type									
Category	Description	impairment			Category	Description	impairment		
		physical	visual	intellectual			physical	visual	intellectual
Route to latrines	Distance	✓✓	✓	✓	Cubicle	Length + width	✓✓		
	Width	✓✓	✓			Arrangement internal fixtures	✓✓	✓	
	Slope	✓✓	✓			Light levels	✓✓	✓✓	✓✓
	Surface hazards	✓✓	✓✓			Floor-washable/ drains	✓✓	✓✓	✓✓
	Guidance	✓	✓✓			Cubicle handrails	Diameter		
	Secure route	✓	✓	✓✓	Section				
	Used by outsiders	✓✓	✓	✓	Clearance from wall				
Ramp/ steps	Width	✓✓	✓		Height	✓			
	Slope (gradient)	✓✓	✓		Length	✓			
	Length/ landings	✓✓	✓		Seat	Present?	✓✓		✓✓
	Steps	✓✓	✓			Material			
	Supports	✓✓		✓		Height	✓✓		✓
External Doors – latrine block	Doorway present?	✓✓	✓			Length			
	Door present	✓✓	✓			Seat width			
	Landing present	✓✓				Opening width	✓✓		✓✓
	Door opens in or out	✓✓	✓			Opening length			
	Openable by disabled child	✓✓	✓	✓✓		Cleansing material	Type?	✓✓	✓✓
	Clear doorway width	✓✓	✓		Location		✓✓	✓	✓✓
	Door handle height/ width	✓✓	✓✓		Hand washing water	Location	✓✓	✓	
	Door lock height	✓✓	✓			Reachable by wheelchair	✓✓		
Lockable by disabled child	✓✓	✓	✓✓	Height		✓✓	✓		
Disabled sign?				Tap useable by disabled child		✓✓		✓✓	

5.1.8.1. *Conflicting needs*

Since this research has been based on the principles of universal design, when identifying those features beneficial to a wide range of disabled students, it is important that features do not exclude particular groups of users.

Restricting potential benefits or ensuring latrine accessibility by the disabled?

The locking of accessible toilets was found at all mainstream schools (4.1.3), whereas special school toilets' were open to use by all. The rationale for locking them is to ensure they remain clean

by preventing use by non-disabled students. It is not thought that students would purposely dirty them, rather that the sheer number of students would make them unclean and since cleanliness is the key concern of disabled students then this cannot be risked.

This approach is at odds with the concept of universal design which aims to benefit as wide a range of users as possible. Features which would benefit other students cannot be utilised and dissemination of accessible sanitation solutions into the community is not possible (4.8.3). Therefore it may be worth providing seats or handrails in some other cubicles for general use.

The use of small padlocks means that many disabled students still require assistance when going to the toilet, making them dependant (WaterAid Mali 2007:1). Another aspect of this approach is that it segregates disabled students from their peers which also occurs when disabled children use teachers' facilities. However the researcher presumes that disabled children welcome the preferential treatment but it may not be appreciated by other students (4.1.3, 4.2.4) (EENET 2010:10).

The locking of cubicles has two other negative effects, it prevents the accessible cubicle from reducing the school's student: latrine ratio (2.11.4) and adds weight to the argument that accessible facilities are expensive since they are only used for a few students.

The decision to lock or not to lock is one that needs further discussion but has interesting parallels with other research which found accessibility features introduced in household or communal latrines had excluded use by other household or community members (Jones 2011, Fawzi 2010) potentially reinforcing negative views about disabled people.

Water

Although water is not considered an accessibility feature the benefits of water for both disabled and non-disabled students was reported by a number of informants. Those with visual impairment stated that full flush or pit toilets were preferential to pour flush, since they were unable to check whether waste had been successfully washed away (4.7.1.4, 4.7.1.6). However this may conflict with the technical sustainability of latrines if water supplies are inadequate (4.4.3).

Direction of door opening

Visually impaired users reported that inward opening doors were helpful to them as they could more easily find and close the door (UNICEF et al 2004:3). This is at odds with the view that outward opening doors are easier for wheelchair users since it provides more space within the cubicle to manoeuvre but still requires the child to reach the door to close it. To avoid the need for even larger cubicles, outward opening doors could be fitted with external door stops, full width handrails or rope door closers (Jones & Reed 2005:61) to benefit both groups. Two-way hinges could also be provided but can make a door less manageable (Jones & Reed 2005:59, David 2008:24).

Slipperiness

Roughened surfaces on ramps, corridors and latrine floors aid students with impaired mobility but is contrary to good sanitation practice as they are more difficult to clean and can cause injury to crawling users.

Seats

Many interviewees who did not have experience of seats said that they were dirty and they would not like to use them. However both intellectually and physically impaired students who had experience of using seats preferred them (4.7.1.6).

There is a need to test designs to prevent splashing and enable hygienic use and easy anal and seat cleaning (4.1.2.6) (Shrestha 2006:6)

Doors and privacy

Primary school students in general seem to have little use for doors or door locks a behaviour found by others (4.1.3) (Chambers 2005:63) although privacy is a concern for all girls in general (EENET 2010:10). Poor door and hinge quality often meant they pose added risks to latrine use. However physically and intellectually disabled students who either require assistance or longer in the toilet said that privacy was a problem (4.7.1.8). As noted in 5.1.1.3 designs which can provide privacy without doors may be beneficial if security can be assured.

5.2. Inaccessible toilets - a barrier to disabled children's education?

Objective 2. Identify the significance of inaccessibility as a barrier to disabled children's enrolment, attendance, attainment and completion in inclusive primary education.

The findings suggest that inaccessible sanitation in itself is not a major barrier to disabled children accessing primary education (4.7.3, 4.8.14.2). However the fact that sanitation is a sensitive subject and that disabled people in Tanzania already face stigma, negative attitudes and the perception that they are unable to help themselves, it seems likely that they would be unwilling to admit that sanitation used by the rest of society is not 'good enough' for them. This issue was recognised by a Handicap International study in Mali which noted that disabled people's response on sanitation difficulties are very possibly inaccurate (Horne & Debeaudrap 2007:19) and may explain some of the inconsistent responses received from informants.

There is anecdotal evidence that inadequate sanitation is not just a barrier (Tanga Coalition 2005:15) but also detracts from effective education and there is no reason to believe that the impact on disabled students would be any different and common sense suggests that the effect would be greater (2.4.2).

5.3. Understanding institutional barriers to inclusive sanitation

Objective 3. Understand the institutional environment in relation to provision of accessible sanitation in primary schools

The principle purpose of this objective was to inform the field research methods to be used to achieve research Objectives 1, 2 and 4. It is not the intention of this research to make suggestions or recommendations on the institutional environment beyond those included in addressing the other objectives.

5.3.1. Stakeholders

The document review and key informant interviews identified that the responsibility for physical accessibility of public buildings is spread over a number of Ministries and that in practice their activities are not well coordinated, despite the existence of a MoU between the four main agencies (2.9.4.3). Further evidence is the low numbers of schools registered as Inclusive and the absence of plans to meet the NSIE policy on providing barrier-free environments, despite the existing NPD requirement.

There are a number of existing acts, policies and strategies which refer to physical accessibility and which fall under the remit of different departments. With regard to school accessibility, MoEVT has

no policy although the SEDP Technical Handbook provides some geometric guidelines.

The issue of communication was raised by nearly all literature and key informants as essential for successful implementation of the inclusive education strategy, and for the successful piloting and rolling out of the NG SWASH (HakiElimu 2008).

In addition the extensive presence of international NGOs in Tanzanian infrastructure provision, particularly in the water and sanitation sectors, provides opportunities for disability sensitive development policies to be required as part of funding conditionality (NCPD & WaterAid Ghana 2010:8,23).

5.3.2. Regulations and standards

The document review indicates that there are a number of opportunities to align and strengthen existing policy and strategy to optimise the effectiveness of any future technical standards.

The status of various draft documents allows scope for review and reinforcement to ensure all education, sanitation and disability legislation is consistent and provides minimal scope for non-compliance by designers and contractors, particularly the Buildings Bill and Draft Sanitation and Hygiene Policy which have yet to be finalised.

Relevant accessibility guidance, though limited, has been developed in all three sectors, SEDP Handbook (Education), NG SWASH (WASH) and BEST-AC (Disability/ construction), indicating that there is a level of interest.

5.4. The extra cost of accessible sanitation

Objective 4. Estimate the construction costs of accessible sanitation in relation to school sanitation

5.4.1. Document collection

There is a general lack of data on this topic which makes advocacy for accessible sanitation difficult (Collender et al 2011:5; NCPD & WaterAid Ghana 2010:10). For the same reasons that other research has had difficulty assessing costs (Tietjen 1999, Neba 2010) this study had difficulty accessing good quality BoQs (3.9, 3.13.5).

5.4.2. Estimating extra cost

As noted in 5.4 the ability to use the primary data collected was constrained by the quality and level of detail which prevents direct use or comparison (3.9.2)

Therefore it was necessary to develop secondary data on construction costs. Although experienced in this activity, it required the researcher to make numerous assumptions about the methods of measurement and local methods of construction.

- ✓ In order to accurately assess the extra costs of accessible infrastructure, implementing agencies should develop detailed BoQs in line with the national Standard Method of Measurement, and maintain records of actual costs and the causes and impact on cost of on-site variations.
- ✓ The method by which “extra cost” is defined will need to be agreed and the same elements included in all analyses, e.g. labour, plant and temporary works included under the relevant BoQ works item.
- ✓ Sufficient data from a number of sources will be required to enable robust analysis, enabling identification of anomalous data due to poor contractor experience, inadequate supervision, remote geographical locations or unusual fluctuations in materials prices.

5.4.3. Comparing Extra cost of accessible sanitation

5.4.3.1. Comparing extra construction cost of accessibility

Due to the greatly varying contexts and standards in which facilities have been provided and costed, it is difficult to make robust comparisons of the data.

4.10.1.4 identifies the reasons for the differences between the literature and the study findings.

Without further information on the literature calculations further discussion is limited, however it draws attention to the need for detailed data to be collected and consistent methods of calculation and units of comparison.

The data from the literature reviewed was not sufficiently detailed to develop equivalent cost/ cubicle or cost/m², the most appropriate methods of comparison.

NGOs implementing sanitation projects should be perfectly placed to carry this out having access to all the relevant data and technical knowledge for both new and retrospective works.

5.4.3.2. Only construction costs?

Although interviews included questions on O&M costs, hardly any information was available, and no documents and this research is limited to comparing only construction costs.

The WASHcost programme, coordinated by IRC draws attention for planners to consider the whole life costs of sanitation facilities (IRC 210a, IRC 2010b), but other documents also exist on the subject (Theunynck 1999, WELL 2006, Leathes 2009).

It is important to plan and budget for appropriate operation and maintenance costs to ensure serviceability of the structure over the design life.

Hence common sense suggests that when placed in the perspective of WLCs, the “additional” costs of inclusive sanitation will be small (2.11.5).

5.4.3.3. Planning retrospective accessibility

Due to the fact that many schools already have latrines which are inaccessible (3.8.4.2, 4.1), which to replace in their entirety would take time and money, the issue raised by SNVs WASH Advisor (4.8.7.7) with regard to rehabilitation seems pertinent.

The difficulties faced by SNV stem from the fact that data collected during SWASH mapping has then been used to plan works, a purpose which the checklists are not designed for, but to save time and money revisiting the schools this has formed the basis of rehabilitation plans. Below-ground elements have not been assessed and detailed survey of the superstructure is not included.

Therefore, when trying to estimate costs of refurbishment or retrospective adaptation for accessibility, it is very difficult to determine whether or not this is either possible (structurally) or managerially (will the pit be full soon or collapse?).

This issue needs further thought and discussion.

5.5. Other barriers to inclusive education

Although this study is focussed on the role of accessible sanitation in facilitating inclusive education, it is clear that there are many other, more fundamental barriers. Although the extent of their effects has yet to be quantified, failure to address them means that investment in accessible latrines will have limited impact on Universal Primary Education goals.

In line with the social model of disability, those barriers most frequently identified by interviewees are noted here.

5.5.1.1. Social barriers

Social awareness of disability at all levels was the most commonly cited barrier (4.8.7) (DFID n.d:p3, Tesfu & Magrath 2006, Ahmed et al. 2011:5). Lack of awareness amongst policy makers, engineers, teachers and parents in relation to inclusive education and accessible designs was mentioned by nearly all adults in common in other countries (Jones 2011, NCPD & WaterAid Ghana 2010:12, 22, UNICEF et al n.d.). Although disabled people were observed by the researcher in nearly all locations visited, many interviewees both expressed and exhibited feelings of shame and embarrassment in discussing disability (4.8.4) (Horne & Debeaudrap 2007:19) and though no individual personally acknowledged discriminating against disabled children it cannot be dismissed (TENMET 2009).

Unhygienic use of sanitation facilities is a major barrier for disabled students (4.8.2). The low cultural importance of handwashing was acknowledged and although teachers often recognised that school toilets were dirty, few felt it was important enough for them to do anything to improve the situation.

5.5.1.2. Institutional barriers

The absence of definitive government plans, targets and monitoring to support existing policy and strategy in relation to inclusive education was the main institutional barrier raised. This issue is identified in the literature both in relation to disabilities policies in general (NCPD & WaterAid Ghana 2010:21, DFID n.d:10) but also specifically to Tanzania (Aldersey & Turnbull 2011).

Government lapses in the formal registration of Inclusive Schools was apparent by the fact that only 1 mainstream school mentioned having recognition which agrees with the findings of a study in Tanga region (Tanga Coalition 2005:17). All associated support including moral support was therefore absent and a cause of annoyance for many teachers (4.8.6).

Inadequate and inconsistent disbursement of funds for all aspects of school operation was a major problem.

Although some work has been done, notably the MoU between the four key ministries, accessible sanitation in government schools is already mandatory under the NPD and therefore needs to be enforced (DFID n.d:11). Greater efforts in coordination and communication between the sectors is required (Wiman & Sandhu 2004:25, Groce & Trani 2009)

Finally, the general failure by all implementing agencies to insist on accessible designs in their development activities and to adequately supervise and enforce both accessibility and good (4.10.4) sanitation features during construction (NCPD & WaterAid Ghana 2010:12).

5.5.1.3. Physical barriers

The general physical environment in Tanzania is quite challenging in both rural and urban areas and many interviewees stated that distance to school was a problem (4.5.2, 4.7.1.1, 4.7.3.2).

Awareness about accessible infrastructure was very low and few people knew where technical advice could be accessed (NCPD & WaterAid Ghana 2010:12).

5.5.1.4. Financial barriers

The “extra” cost of accessible sanitation is often cited as a barrier, but although accessibility standards and guidelines may specify best practice, local and low cost materials can be substituted (NCPD & WaterAid Ghana 2010:13, Sinha et al 2006:539). Notwithstanding any extra costs, the economic potential and human rights justifications for accessible sanitation appear to outweigh any justifications for failing to provide accessibility of the basis of extra cost (2.4) (David 2008:6).

6. Conclusions

The main conclusions and recommendations relating to accessible school sanitation will be organised under the barriers identified in the social model of disability. This section also identifies the key financial and institutional barriers to inclusive design in Tanzanian primary schools to ensure that the research has thoroughly addressed all aspects related to the topic.

The key stakeholders in respect of each recommendation will be indicated, where “government” refers to all levels of government down to municipal level. Schools themselves are considered to be part of “Civil Society” which includes public and private organisations, NGOs, religious or community groups who are active in each of the sectors of Sanitation, Education, Disability or Construction. All recommendations are relevant to National level donors who are active in the respective sectors. It will review whether the objectives of the study have been met and some recommendations to improve data collection methods for future research will be noted.

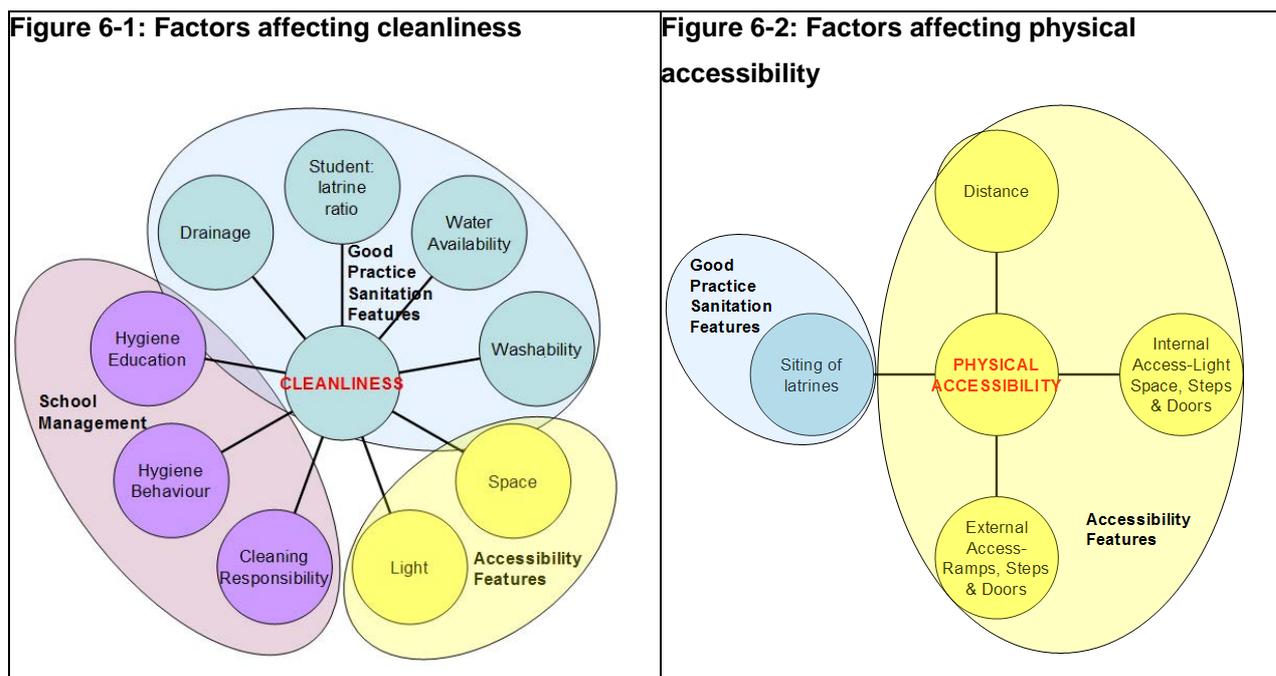
6.1. Overcoming the environmental and physical barriers

6.1.1. The key physical barriers to accessible school sanitation

Two barriers related to environmental and physical inaccessibility were identified.

The key concern was cleanliness which particularly affects physically disabled children who crawl but also those using crutches as well as visually impaired students (5.1.2.6). This issue of cleanliness is identified as a barrier by all students due to health and safety fears as well as loss of dignity. It negatively affects how students use the facilities which exacerbates the problems for disabled students.

As noted in 4.2.2.6 the desire for independence overrides the demand for convenience and this was also found by WaterAid Ethiopia i.e. students would prefer crawl in clean toilets than use a wheelchair in dirty ones. Cleanliness is dependant on a number of accessibility and good sanitation practice features, as well as school management (Fig 6-1).



The physical barriers relate to reaching the latrine and then accessibility within the latrine. Reaching

the latrine is principally related to distance but also the condition and security of the route, both basic considerations for the design of any school sanitation (Fig 6-2).

Access within latrines is dependant on the width of doorways, corridors and cubicles as well as the presence of lighting, steps and floor surfaces.

The issue of light and space influences both cleanliness and physical accessibility, aiding latrine use, makes cleaning easier and encourages good hygiene practices (4.1.2.2, 4.1.3, 5.1.2.6)

Supports within the latrine in the form of seats or handrails need to take into account the different sizes of children as well as the need for anal cleansing, latrine cleaning. Cultural concerns about seat cleanliness appear to be overcome by the benefits they bring to disabled user (5.1.1.7).

Therefore a holistic approach to sanitation is necessary to ensure accessibility for disabled students and requires their involvement to identify the most suitable solutions. This conclusion is consistent with those found by other watsan agencies working with disabled people. There is a range of experience already in Tanzania (5.3.2) and these should be drawn together to finalise the NG SWASH and feed into standards on accessible sanitation for all public buildings.

6.1.2. Recommendations to address the physical barriers

The recommendations fall under two themes, those relating to sanitation design and those relating to use and management. However many of these also rely on changes in the institutional, social and financial environments.

Figure 6-3: Addressing the physical barriers	Government	Civil Society			
		Sanitation	Education	Disability	Construction
Finalise technical accessibility design and compliance standards including performance measurement indicators with the participation of disabled children and disseminate	✓	✓	✓	✓	✓
Integrate accessibility standards into all school sanitation i.e. not optional	✓	✓	✓		
Develop procedures for safely and economically providing retrospective accessibility to existing school latrines		✓	✓		✓
Enforce general sanitation standards, including water supply and drainage	✓				✓
Finalise and enforce maximum student: latrine ratios	✓				
Develop on-site water source solutions	✓	✓			✓
Formalise and support hygiene education	✓	✓	✓		
Improve latrine cleaning and maintenance with appropriate resources and management	✓		✓		
Education and sanitation NGOs to include accessibility in physical as well as project design as a requirement		✓	✓		

6.2. Highlighting the socio-cultural barriers

6.2.1. The key social barriers to accessible school sanitation

The lack of awareness about disability is the root cause of the other barriers, both internationally and within Tanzania (4.8.1, 4.8.4, 4.8.7, 5.5). Low understanding of disabled peoples' needs is reflected in low awareness of education options for disabled children and inaccessible school and school sanitation designs (4.4.1, 4.4.2).

Societal ambivalence to education remains in some parts of Tanzania, but was not found extensively during this research. However this finding will have been affected by the fact that few out-of-school disabled children were interviewed.

As a result segregation of disabled children continues in a number of guises:

- Disabled children hidden from society
- Disabled children's options perceived to be confined to special education and unable to access mainstream education
- Disabled children dependant on others to reach school and use inaccessible toilets
- Disabled students' use of teacher's or specific accessible toilet cubicles singles them out
- Loss of dignity for disabled children who are unable to keep clean due to dirty facilities and lack of water when using school toilets

In addition:

- Lack of general awareness of good sanitation and hygiene behaviour impedes understanding of sanitation options
- Accessibility concepts are not disseminated into the community to benefit other vulnerable people
- Other vulnerable students fail to benefit from accessibility features in disabled toilets
- The cost of inclusive infrastructure is difficult to justify if accessible toilets are limited to use by a few disabled students and contributes to high student: latrine ratios.

6.2.2. Recommendations to address the social barriers

Figure 6-4: Addressing the social barriers	Government	Civil Society			
		Sanitation	Education	Disability	Construction
Ongoing disability awareness and advocacy with practical involvement of disabled people	✓			✓	
Support existing disability, inclusive education and physical accessibility policies with specific activities, adequate resources and defined assessment criteria	✓		✓	✓	✓
Disseminate existing accessibility guidelines and documents with other sectors, not just disabled people's organisations and facilitate training of designers, contractors and artisans.	✓	✓	✓	✓	✓

6.3. Addressing the institutional barriers

6.3.1. The key institutional barriers to accessible school sanitation

The institutional barriers relate to policy and decision makers' general lack of awareness about disability and how easily accessibility can be achieved as well as an absence of coherent legal requirements for accessible infrastructure. The disjointed state of federal policies, strategies and national objectives translates into lack of action and resource allocation.

The media and interviewees all indicated that the government's inclusive education strategy was under-resourced, but suggested political rather than financial causes (4.8.7.3, 4.8.7.9).

Despite the signing of the MoU by the four key ministries (2.9.4.3), the lack of communication between the responsible government agencies as well as the development sector is evidenced by the fact that strategies, policies and objectives are currently not complementary or cohesive, thereby missing opportunities to reinforce each other (2.9.4)

The absence of consistent technical guidelines (2.9.4.3) and failure to enforce the existing requirement for accessibility to all public buildings (2.9.4.2) perpetuates the situation. URT should take up offers from by disability organisations to provide support and technical advice (2.2.6) in order to achieve poverty reduction targets.

6.3.2. Recommendations to address the institutional barriers

Figure 6-5: Addressing the institutional barriers	Government	Civil society			
		Sanitation	Education	Disability	Construction
Reinforce the existing legal requirement for accessibility of public buildings by implementing the policy statements and activities of the 2004 NPD in collaboration with the various stakeholders already addressing accessibility issues	✓				✓
Ensure appropriate detail, accountability, regulation and enforcement is included in the Buildings Bill in accordance with UN Standard Rule No. 5 (2.9.2)	✓				✓
Ensure appropriate requirements for accessible school infrastructure are included in the final Sanitation and Hygiene Policy (2.8.3.2)	✓	✓	✓		
Ensure that agencies involved in inclusive education activities are aware of the technical solutions for accessible infrastructure, to enable programme planning to consider all options equally	✓		✓		✓

6.4. Demystifying the financial barriers

6.4.1. The key financial barriers to accessible school sanitation

The lack of construction cost data currently prevents robust assessment and therefore justification for “extra” funding (5.4.1). Advocates for barrier free infrastructure use the Metts 1% (Metts 2000) whilst those opposed to its provision cite common sense that costs must be higher.

Although this study has contributed towards the small number of studies on the topic it has limitations

due to the small quantity of data (5.4.1) and the theoretical nature of the cost estimates (3.13.5). More detailed contemporary records of actual school latrine costs (5.4.2) using the national standard method of measurement would enable more robust analysis to be conducted (3.9.4, 3.10.4).

Notwithstanding the lack of data, the study has found that failure to provide accessible school sanitation on the basis of construction cost alone is illogical considering that construction is but a fraction of the whole life costs of the facility (2.11.5)

Additionally the literature suggests that this attitude is a false economy, not only because of the proven economic benefits of both school sanitation (2.8.1) and sanitation in general (2.4.1) but because every disabled person not using a latrine represents a failure to meet the basic purpose of sanitation programmes (2.4). In addition the human rights justification for equal access to sanitation and education exist throughout Tanzanian federal and national law (2.9.2)

6.4.2. Recommendations for addressing the financial barriers

Figure 6-6: Addressing the financial barriers	Government	Civil society			
		Sanitation	Education	Disability	Construction
MoEVT needs to implement existing procedures to recognise inclusive schools and provide support as outlined in the NSIE and NPD (2.6.2.1, 2.9.4.2). Inclusive education may be a cheaper alternative not a free alternative	✓				
Implementers of school infrastructure to maintain better quality records using national standards for analysis and development of budgeting guidelines	✓		✓		✓
Involvement of the local construction sector in development of technical standards and designs to optimise use of locally available materials and construction methods to minimise “extra cost”	✓				✓

6.5. Achievement of research goal

The findings of this study support the limited work already undertaken by others on the subject of accessible sanitation, but contributing specific information within a primary school setting.

Of particular benefit to relevant agencies in Tanzania, the study takes into account the cultural and institutional context as well as some specific issues related to Tanzanian norms of design and construction. However the purposive nature of sampling has restricted the sources of data and therefore the research cannot be taken as representative of all schools and disabled primary school aged children throughout Tanzania.

6.6. Achievement of research objectives

Assessment of the benefits of different sanitation features (Objective 1) has been achieved, and the benefits for students with a range of disabilities are identified. Conflicting preferences for the different disability groups as well as with best practice sanitation are highlighted. Problems that occurred in the implementation of accessible designs were identified to differentiate between effective and ineffective accessibility provisions.

How important a barrier inaccessible school sanitation is to inclusive education (Objective 2) has been

assessed. However, due to a range of factors the researcher feels that the level of data from disabled children could have been better, but was limited for a variety of reasons (3.13).

With regard to Objective 3, through the literature review, key informant interviews and document review a fairly clear picture of the theoretical institutional environment has been gained. However, as with all institutional issues, the practical environment which influences and constrains the implementation of accessible school sanitation is likely to differ once subjected to political and financial pressures.

Estimating the extra cost of accessible construction (Objective 4) is not entirely to the researcher's satisfaction. Despite identification of data collection as a problem during the field preparation stage and making every effort to locate relevant documents, the data acquired was limited. As a result much of the information relies on data from disparate sources and calculations from first principles, requiring assumptions about construction details. Best practice cost estimating adjustments for contractor experience, geography and date of construction could not be accounted for.

The lack of data in the desired format and the diversity of previous costs analyses mean that results are not comparable and further comment can only be made with caution.

6.7. Review of research methodology

Further to the limitations noted in 3.13 this section highlights critical issues relating to methodology that may be of use to ensure the relevant data is captured in future research.

6.7.1. Accessibility Audits

- ✓ As noted in Box 5.1 and 5.3, the involvement of users during the accessibility audit cannot be understated to determine if the spatial arrangements are accessible.
- ✓ The status of good practice water and sanitation features were of greater importance to disabled children than expected and therefore need to be included in accessibility audits

6.7.1.1. Clarification of measurement and compliance criteria

As explained in Section 3.8 the NG SWASH was used as the main basis for defining compliance criteria, but its application during field visits identified a number of issues regarding use.

- ✓ It is essential that the method of measurement and compliance criteria are concise and clear for all possible scenarios.
- ✓ Information on context specific disability aids (Box 4.1), method of use and normal sanitation management (4.4.1) is required to inform the compliance criteria.
- ✓ Pragmatic and objective methods of assessment for all criteria are required (3.14.1, 4.2.4)

6.7.1.2. Holistic spatial assessment

Assessment of features based on compliance criteria alone is not adequate and other spatial factors need to be included in the assessment which cannot be easily incorporated into a 'checklist' approach:

- ✓ Assessment needs to be undertaken by personnel with relevant understanding and training.

6.7.2. Interviews

6.7.2.1. Interview and observation tools

- ✓ Interviews require sufficient time (3.14.2) to allow the sensitive subjects of disability and latrine use to be addressed comfortably, particularly with disabled children (3.13.7.4).
- Interviews need students to be available out of school hours and all efforts to achieve this must be made, such as providing transport or compensating for lost time (13.3.2)

- The sensitivity of the subject is likely to affect how honest the respondents are about difficulties (3.13.7.5)
- ✓ Understanding disabled students' actual use and preferences requires their full understanding of the questions being asked. Theoretical or abstract questions can only be avoided by conducting interviews at the latrines (3.13.4)
- ✓ Staff awareness of the barriers faced by disabled students can only be improved by them witnessing or experiencing the difficulties students face (4.8, 4.8.1)
- ✓ Any observation of latrine use will be influenced by researcher effects therefore sufficient time is needed for students to become comfortable with a researcher near the toilets. (3.12.3.5, 3.13.1, 3.13.7.4).

6.7.2.2. Communication

Communication was obviously a major challenge, but even if the researcher had been fluent in Swahili there were a number of student interviews that were particularly difficult to conduct without introducing researcher effects.

- ✓ Plan how interviews with young, intellectually or speech impaired students will be conducted. Holding interviews at the latrines with mutual demonstration of use or some form of participatory game may help (3.13.1, 3.13.2, 3.14.3)

6.7.2.3. Understanding unfamiliar concepts

Since the facilities visited had different combinations of features, their perceived benefits of features could not be discussed with all disabled students. More common features are likely to be preferred more frequently than those that are less prevalent. Similarly, as so few interviewees, adults and children, had experience of using accessible features it was not possible for them to identify long term benefits or disadvantages

- ✓ Photographs or physical examples are required to overcome the difficulty of discussing features of which the interviewees have no experience (3.13.4) Technical drawings are not easily understood by lay people.
- ✓ The benefits perceived by students and managers at special schools with accessible facilities should be sought due to their familiarity with a range of features over a period of time (3.13.1, 3.13.4)

6.7.2.4. Assessing who benefits

As noted in 3.5.2.1

- ✓ Classification based on functional limitations is more relevant based on observation and information provided by disabled children or their parents.

6.7.2.5. Not a complete picture

Since the majority of child interviews were with students, only data for children who had already overcome a number of barriers to attend school were gathered (3.13.3). Hence their perception of the barriers to education; and of inaccessible sanitation in particular; is likely to be affected.

Only one child who had not completed school was interviewed and so the reasons for failing to enrol could only be asked of to her. For other students, it was often difficult to get clear reasons for starting school late since they themselves were not certain of the pressures on the family which affected their enrolment (4.7.3)

- ✓ To understand the barriers to disabled children it is necessary to talk children who are out of school
- ✓ To understand the social and financial barriers to education of disabled children it is necessary to also talk to parents

6.7.3. Literature and Document Review

The literature review was able to draw on a variety of reliable sources including international agencies, academic institutions, water and sanitation development organisations. However it soon became clear that specific research into accessible sanitation was limited and came from two main sources, i.e. WEDC and WaterAid.

Similarly data on disability and specifically child disability in Tanzania and in Tanzanian schools all came from URT sources, namely NBS and MoEVT, but was inconsistent in approach and level of detail as well as containing some discrepancies.

Data on educational enrolment, attendance and attainment lacks basic baseline data for disabled children, such as the percentage of the school aged population that is disabled. Without this data it is impossible to monitor progress of government disability activities

With regard to the institutional environment, the United Republic of Tanzania has in place a number of relevant acts, policies and strategies which were the basis for meeting Objective 3. However, their effectiveness in practice could not be assessed from these documents (3.5.5).

Documents sought in the field as the basis for cost estimating were of varying quality (3.13.5) and detail. This could only be overcome if either:

- ✓ significantly more documents were collected to allow for the low usefulness rate
- ✓ if construction data was specifically collected with such an analysis in mind to ensure sufficient detail and accuracy

6.8. How this research can be used

This research, though focussed on the physical aspects of accessible sanitation, has highlighted the relevance of social barriers which in turn create institutional, physical and financial barriers to provision of effective accessible school sanitation.

It reinforces the view that accessible sanitation can be fairly simply achieved but requires greater awareness of society to the challenges faced by disabled people and the critical importance of disabled people's involvement in any plan, design or construction intended for their use. A similar conclusion is reported in a number of WEDC and WaterAid Briefing Notes. Activities should not be confined to the disability sector, recognising that attention paid to the most vulnerable provides benefits for others.

To facilitate the use of the conclusions and recommendations, this study will be shared with the various agencies which facilitated the field research in Tanzania and a Fact Sheet will be developed on the issue of assessing the costs of accessibility features.

Assessing the extra cost of accessible sanitation remains an area for further research. However as succinctly put by Bob Reed at the 35th WEDC International Conference, "financial reasons for not including accessibility are a diversion, if we fail to include disabled people in sanitation [planning] then sanitation will fail"

6.9. Further research activities

Below are a number of activities that could be undertaken to improve the data in relation to the topic.

- ✓ Investigate the specific benefits of sanitation for disabled people
- ✓ Research any long term problems of health or latrine cleaning and maintenance associated with sanitation accessibility features.
- ✓ Explore the use of accessibility features by students in schools with accessible sanitation who are able to identify preference of the full range of features over extended periods of time
- ✓ Use contemporary construction contract data from inclusive sanitation programmes for financial assessment of the “extra cost” of accessible facilities using standard construction industry methods for comparison
- ✓ Conduct “in-use” trials of seat designs to address buildability, comfort, splashing and latrine maintenance balanced against anal cleansing needs
- ✓ Review the historical drivers for inclusion of mandatory accessible sanitation internationally, to identify the factors which finally made the issue of “extra cost” irrelevant.

6.10. Concluding Remarks

This research cannot conclude that inaccessible sanitation is currently a major barrier to inclusive education. There are other more pressing barriers all resulting from negative social attitudes towards disability which currently play a greater role in preventing disabled children from enrolling in school.

However there are reasons to believe that poor school sanitation has a role in compounding the particular health problems of disabled students and contributes to their dropping out of school earlier than their non-disabled peers. For school sanitation to facilitate the attendance of disabled students requires a whole range of issues to be addressed from social, institutional, financial to technical.

There is a need to use the existing opportunities to formalise communication between the education, sanitation and disability sectors and ensuring that the construction sector is on board to formalise and mainstream accessibility standards and enforce them.

Raising the status of sanitation, raising awareness about technical alternatives, improving hygiene behaviour and latrine management could provide significant benefits for all students, disabled or not.

Preventing disabled children from accessing education compounds their dependence on others and their marginalisation in society. Inaccessible school sanitation contributes to this situation.

7. References

- Adams, J., Bartram, J., Chartier, Y. & Sims, J. (eds) 2009, *Water, sanitation and hygiene standards for schools in low-cost settings*, World Health Organization, Geneva, Switzerland.
- Ahmed, S., Jahan, H., Bala, B. & Hall, M. 2011, "Inclusive Sanitation: breaking down barriers", *35th WEDC International Conference* WEDC, Loughborough, UK, 6-8 July 2011.
- Aldersey, H.M. & Turnbull, H.R. 2011, "The United Republic of Tanzania's National Policy on Disability: A Policy Analysis", *Journal of Disability Policy Studies*, vol. XX, no. X, pp. 1-1-10.
- Bailey, N. & Groce, N.E. 2010, *Water and Sanitation Issues for persons with disabilities in low and middle income countries*, LCD UCL, London, UK.
- Bonner, R., Das, P.K., Kalra, R., Leathes, B. & Wakeham, N. n.d., *Delivering Cost Effective and Sustainable School Infrastructure*, The TI-UP Resource Centre, UK.
- Boon, S. 2011, personal communication + meetings (May-July 2011).
- Bosch, C., Honmann, K., Rubio, G.M., Sadoff, C. & Travers, L. 2001, *Water, Sanitation and Poverty*, draft for comments.
- Bryman, A. 2004, *Social Research Methods*, 3rd edn, Oxford University Press, New York, USA.
- Cabot, P. 2010, *WASH and inclusive education in Tanzania*, Comprehensive Community Based Rehabilitation in Tanzania, Dar es Salaam, Tanzania.
- Cairncross, S., Feachem, R., 1993, *Environmental Health Engineering in the Tropic: An Introduction Text*, 2nd edition, John Wiley, London, UK
- Carriger, S.C. (ed) 2007, *Towards Effective Programming for WASH in Schools: A manual on scaling up programmes for water, sanitation and hygiene in schools* (technical paper series 48), IRC International Water and Sanitation Centre, Delft, The Netherlands.
- CCBRT 2010, *Employment of Persons with Disabilities in Dar es Salaam Tanzania*, Comprehensive Community Based Rehabilitation Tanzania, Dar es Salaam, Tanzania.
- Chaggu, E. 2009, *Sanitation Sector Status and Gap Analysis: Tanzania*, Water Supply & Sanitation Collaborative Council, Global Sanitation Fund, Dar es Salaam, Tanzania.
- Chama cha Walelavu Tanzania (CHAWATA) 2008, *Disability not Inability: Give people with disability access to the Tanzanian Economy*, fact sheet , BEST-AC, Dar es Salaam, Tanzania.
- Chambers, D. 2005, *An exploratory study on Inclusive Design with a focus on accessibility of water and sanitation for disabled people in Central Malawi*, MSc , WEDC, Loughborough University, UK.
- Christian Blind Mission (CBM) n.d, *Justification: to support the inclusion of a disability perspective in the Water and Sanitation sector*.
- Chuwa, A. "Characteristics of the Handicapped Population in Tanzania", *6th Africa Symposium on Statistical Development* URT, NBS, Cairo, Egypt, 2010.
- Collender, G., Wilbur, J. & Gosling, L. 2011, *Including disabled people in sanitation and hygiene services*, Briefing Note , London, UK.
- Contractors Registration Board n.d., *Sustainable Structured Training Programme: Element 7 -Principles of Construction Cost Estimating*, training materials edn, Dar es Salaam, Tanzania.
- DANIDA n.d., *Access to water and sanitation for persons with disability: Technical Issue Note 4*, Denmark.
- David, V. 2008, *How to build an accessible environment in developing countries. Manual #2 - Access to water and sanitation facilities. Part 1 - Toilets and closed showers*, Handicap International France, Phnom Pemh, Cambodia.
- DFID n.d., *Education for children with disabilities - improving access and quality* Guidance Note, Mott MacDonald, London, UK.
- DFID 2004, *Disability KAR: Assessing Connections to DFID's Poverty Agenda*, DFID, ODG, London, UK.
- DFID 2001, *The Challenge of Universal Primary Education: Strategies for achieving the international development targets* (Target Strategy Paper), DFID, UK.

Inclusive Primary Education in Tanzania: the role of Accessible Sanitation

- DSK 2008, Report on Piloting of Appropriate Sanitation Options for Differently Abled People, Dushtha Shasthya Kendra, Dhaka, Bangladesh.
- Dzikus, A. 2008, "Access to Water and Sanitation for the Disabled for the Differently Abled", UNECA-Leonard Cheshire Disability Conference. UN Convention of the Rights and Dignity of Persons with Disabilities: A call for action on poverty and discrimination and lack of access LCD South Asia, Addis Ababa, Ethiopia, 22/5/2008.
- Edmonds, L.J. 2005, Disabled People and Development Poverty and Social Development Papers No. 12, Asian Development Bank, Philippines.
- EEPSCO 2011, *BoQ Mji Mpya PS*, BoQ, Dar es Salaam, Tanzania
- Elwan, A. 1999, Poverty and Disability: A Survey of the Literature (Social Protection Discussion Paper Series 9932), World Bank, Washington, USA.
- Enabling Education NET 2010, "Enabling Education", [Online], no. 14. Available from: www.eenet.org.uk. [17/3/2011].
- Fawzi, A. 2010, Identifying and supporting vulnerable people in CLTS particularly in Bangladesh, MSc, WEDC, Loughborough University, UK.
- Fawzi, A. & Jones, H. 2011, "Identifying and supporting vulnerable people in community-led total sanitation: a Bangladesh case study", *35th WEDC International Conference*, 6-8 July 2011. WEDC, Loughborough, UK
- Fritz, D., Miller, U., Gude, A., Pruiskens, A. & Rischewski, D. 2009, "Making poverty reduction inclusive: experiences from Cambodia, Tanzania and Vietnam", *Journal of International Development*, vol. 21, pp. 673.
- Geodata Consultants Ltd 2010, *School Water, Sanitation and Hygiene Mapping in Tanzania: Consolidated National Report*, UNICEF; SNV Tanzania; WaterAid Tanzania, Dar es Salaam, Tanzania.
- GoT, Ministry of Finance and Economic Affairs 2010, *MKUTUTA Annual Implementation Report 2010*, GoT, Dar es Salaam, Tanzania.
- GoT, V.P.O. 2005, National Strategy for Growth and Reducation of Poverty (NSGRP/ MKUKUTA) 2005-2010, GoT, Dar es Salaam, Tanzania.
- Government of India & UNICEF 2008, *An Inclusive Approach for School Sanitation & Hygiene Education*, Government of India, Ministry of Rural Development, New Delhi, India.
- Groce, N.E. & Trani, J. (forthcoming) 2009, "Millennium Development Goals and Persons with Disabilities", *The Lancet*, .
- Guardian Reporter 2011, 19/2/2011-last update, *Neglecting education at our children's peril* [Homepage of The Guardian, Tanzania], [Online] [2011, 13/3/2011].
- Guardian Reporter 2009, 27/4/2009-last update, *Parents, society barriers to education for children with disabilities* [Homepage of The Guardian, Tanzania], [Online] [2011, 13/3/2011].
- Gummich, D. 2011, *skype conversation and emails 15.7.11*, Architectural Pioneering Consultants Ltd.
- HakiElimu 2008, Do Children with Disabilities Have Equal Access to Education? A research report on accessibility to education for children with disabilities in Tanzanian schools, HakiElimu, Dar es Salaam, Tanzania.
- Handicap International 2011, , Source: Disability, Inclusion and Development [Homepage of Handicap International], [Online]. Available: <http://www.asksource.info/index.htm> [2011, 15/6/2011].
- Handicap International 2009, *Accessibility for all in an emergency context*, Handicap International France, France.
- Handicap International & Christian Blind Mission (CBM) 2006, *Making PRSP Inclusive*, HI, CBM, Germany.
- Her Majesty's Government, Office of the Deputy Prime Minister 2004, *The Building Regulations 2010: Access to and use of buildings M, 2010 Amendment*, HMSO, London, UK.
- Holding, S. 2007, The Access to Water for the Vulnerable in Rural Tanzania, MSc, Cranfield University, UK
- Horne, C. & Debeaudrap, P. 2007, Study on Access to Water, Hygiene and Sanitation for People in a Disabling Situation in Mali (region of Tominian): Data Analysis, Handicap International Mali, Mali.
- HSE 1997, *Lighting at work*, Health and Ssafety Executive, Richmond, UK.
- International Code Council 2011, Global Guideline for Practical Public Toilet Design, Illinois, USA.

Inclusive Primary Education in Tanzania: the role of Accessible Sanitation

- IPP Media 2009, Tanzania - Poor water supply, sanitation disrupt school attendances, <http://sanitationupdates.wordpress.com/2009/01/22/tanzania-poor-water-supply-sanitation-disrupt-school-attendances/> edn, IPP Media, Dar es Salaam, Tanzania.
- IRC 2010a, Briefing Note 1: Life Cycle Costs Approach, IRC, Netherlands.
- IRC 2010b, Briefing Note 1b: Services are forever-The importance of capiatl maintenance in ensuring sustainable WASH services, IRC, Netherlands.
- Jones, H. 2011, Inclusive design of school latrines - how much does it cost and who benefits?, Briefing Note edn, WEDC, Loughborough, UK.
- Jones, H. 2010, Inclusive/ universal design for water supply, sanitation and hygiene (WASH) services- An annotated bibliography, DEW Point Enquiry No. A0332, DFID, UK.
- Jones, H. & Reed, B. 2005, Water and Sanitation for Disabled People and Other Vulnerable Groups: Designing sevrices to improve accessibility, 2006th edn, WEDC, Loughborough University, UK.
- Jones, H. & Reed, B. 2003, Water supply and Sanitation access and use by physically disabled people: Report of field-work in Uganda, WEDC, Loughborough University, UK.
- Kabendera, E. 2009, 24/4/2009-last update, *Illiteracy back in full force - govt* [2011, 13/3/2011].
- Kikwasi, G.J. 2011, *meeting 17.6.11 Lecturer*, Ardhi University, Dar es Salaam, Tanzania.
- Kinondoni Municipality 2011, *Construction Drawing and BoQ for 12 Number Pit Latrine Mkwawa PS*, Construction Drawing and BoQ edn, Dar es Salaam, Tanzania.
- Kisungwe, B.M. 2010, "Accessibility and Buildings - Tanzania", *WSC workshop - Accessibility and the contribution of International Standards* World Standards Cooperation, Geneva, 3-4 November 2010.
- Leathes, B. 2009, *Key factors in the cost effective design and construction of primary school facilities in low income countries*, Briefing Note, Technical, Infrastructure and Urban Planning Resource Centre, London, UK.
- Malima, W. 2009, *Water and Sanitation in Tanzanian Schools*, Tanzania Education Network (TENMET),
- Maswanya, L.P. 2007, "Disabled People and MDGs in Tanzania", *European Conference on 'Millennium Development Goals: Inclusion of People with Disabilities*eseRko, Bratislava, Slovenia, 15-17 May 2007.
- Mdemu, G. 2011, meetings and email correspondence (July-August 2011).
- Menya, C. & Safu, C. 2005, "Inclusive Education facilities in Kenya", *Water and Sanitation for all: practical ways to improve accessibility for disabled people*, 31st WEDC International Conference, Kampala, UgandaWEDC, Loughborough University, UK, 2005, pp. 387
- Metts, R.L. 2000, Disability Issues, trends and recommendations for the World Bank, WB, NY, USA
- Mkumbwa, M. 2011, *meeting 14.6.11, SNV Adviser Water, Sanitation and Hygiene*, SNV Tanzania, Dar es Salaam, Tanzania.
- Modern, J., Joergensen, C. & Daniels, F. 2010, *DFID, disability and education: bridging the implementation gap*, RESULTS Education, London, UK.
- Mont, D. 2010, *Exploring the Relationship between Disability and Poverty*, World Bank, , 2010.
- Montgomery, M.A. & Elimelech, M. 2007, "Water and Sanitation in Developing Countries: Including Health in the Equation", *Environmental Science and Technology*, , no. January, pp. 17.
- Mooijman, A., Snel, M. & Ganguly, S. 2009, *WASH in Schools Manual: South Asia*, IRC International Water and Sanitation Centre, Delft, The Netherlands.
- Mtitu, F. 2011, *meeting 20.6.11 Water and Sanitation Advisor*, Plan Tanzania, Dar es Salaam, Tanzania.
- Muller, J. n.d., , From Jomtien to Dakar: Meeting Basic Learning Needs - of Whom? [Homepage of Deutschen Volkshochschul-Verbandes], [Online]. Available: http://iiz-dvv.de/index.php?article_id=502&clang=1 [2011, 5/4/2011].
- Mwendwa, T.J., Murangira, A. & Lang, R. 2009, "Mainstreaming the rights of persons with disabilities in national development frameworks", *Journal of International Development*, vol. 21, pp. 662.
- Narayan, D. & Prennushi, G. 1999, *Poverty trends and voices of the poor*, unpublished paper prepared for the World Bank edn, New York, USA.

Inclusive Primary Education in Tanzania: the role of Accessible Sanitation

- National Council on Persons with Disability & WaterAid Ghana 2010, Report on NCPD Workshop on Mainstreaming Disability Issues in Water, Sanitation and Hygiene Services, NCPD, WaterAid, Accra, Ghana.
- Navuri, A. 2010, 14/11/2010-last update, *Education is more than equipping every young citizen with Form Four education* [Homepage of Guardian on Sunday, Tanzania], [Online] [2011, 13/3/2011].
- Neba, G. 2010, Costs and benefits of inclusive sanitation facilities for the disabled in mainstream primary schools of low income countries: A case study of Ethiopia, MSc, WEDC, Loughborough University.
- NIDS/MSC, Shia & Nilsson, A. 2011, *Disability Rights in Tanzania*, Melander Schnell Consultants, Uppsala, Sweden.
- NTK's Investment 2011, *BoQs for Kigogo PS; Hekima PS; Kawawa PS*, Dar es Salaam, Tanzania.
- Oxfam GB, IWA, GTZ & WASTE 2009, "Disability and Sanitation", *Innovations in emergency situations*, eds. C. Ruberto & A. Johannessen, International Water Association (IWA), Stoutenburg, The Netherlands, 11-13 February 2009.
- Palmer, R., Wedgwood, R., Hayman, R., King, K. & Thin, N. 2007, *Educating out of Poverty? A Synthesis Report on Ghana, India, Kenya, Rwanda, Tanzania and South Africa*, Centre of African Studies, Edinburgh, UK.
- Pearson, L. 2011, 4/3/2011-last update, Tanzanian girls risking rape for an education [Homepage of BBC News, Tanzania], [Online]. Available: <http://www.bbc.co.uk/news/world-africa-12640342> [2011, 13/3/2011].
- Peters, S. 2004, Inclusive Education, An EFA strategy for all children, WB, New York, USA.
- Philemon, L. 2009, 22/4/2009-last update, Study: School infrastructure not friendly to students with disabilities [2011, 13/3/2011].
- Petro, N.2011. *RWSSP - unit rate base.xls*. WaterAid Tanzania, Dar es Salaam, Tanzania
- Polat, F. 2011, "Inclusion in education: A step towards social justice", *International Journal of Educational Development*, vol. 31, pp. 50-58.
- Possi, M.K. 1996, "Gender and Education of People with Disabilities in Tanzania", *UTAFITI*, vol. 3, no. 2, pp. 155-168.
- Redhouse, D. 2004, 2004-last update, No water, no school [Homepage of WaterAid UK], [Online]. Available: http://www.wateraid.org/international/about_us/oasis/springsummer_04/1465.asp [2011, 08/03/2011].
- Reed, B., Shaw, R. & Chatterton, K. 2008, *Sanitation for Primary Schools in Africa*, WEDC, Loughborough, UK.
- Rukunga, G., Mutethia, D. & Kioko, T. 2006, Why the water and sanitation sector in East Africa should consider disabled people, *32nd WEDC International Conference, Colombo, Sri Lanka* WEDC, Loughborough, UK.
- Russell, T. 2007, All people, one goal, all access: WATSAN for vulnerable groups in Mali, MSC, WEDC, Loughborough, UK.
- Save the Children UK 2008, *Making schools inclusive: How change can happen*, Save the Children UK, London, UK.
- Sen, A. 1999, *Development as Freedom*, Oxford University Press, Oxford, UK.
- Shakespeare, T. & Watson, N. 2002, "The social model of disability: an outdated ideology?", *Research in Social Science and Disability*, vol. 2, pp. 9.
- Shrestha, G.R. 2006, *Case Study on addressing sanitation needs of disabled people in Nepal*, Nepal Water for Health (NEWAH), Kathmandu, Nepal.
- Sinha, M., Trivedi, R. & Godfrey, S. 2006, "A Project to Develop Inclusive Models of Sanitation for Persons with Disabilities", *32nd WEDC International Conference, Colombo, Sri Lanka* WEDC, Loughborough University, UK, 2006, pp. 537.
- Snider, H. & Takeda, N. 2008, *Design for All*, World Bank.
- Solution Exchange India 2009, Impact of School Sanitation on Adolescents Girls - Experiences, Examples.
- Steinfeld, E. 2005, *Education for All: The cost of accessibility*, World Bank, New York, USA.
- Tanga Coalition of Education Disability and Non-Disability CSOs 2005, *Report of the participatory assessment of children with disabilities in the districts of Tanga region*, Commonwealth Education Fund, Tanzania.

Inclusive Primary Education in Tanzania: the role of Accessible Sanitation

- Taylor, B. 2009, *Situation Analysis of Women, Children and the Water, Sanitation and Hygiene Sector in Tanzania*, URT, Dar es Salaam, Tanzania
- TENMET 2009, 3 November 2009-last update, Inclusive Education [Homepage of Mtandao wa Elimu Tanzania Education Network (TENMET)], [Online]. Available: http://www.tenmet.org/public_html/index.php?option=com_content&view=article&id=21&Itemid=63 [2011, 10/8/2011].
- TENMET 2008, 17 November 2008-last update, Barriers to Basic Quality Education [Homepage of Mtandao wa Elimu Tanzania Education Network (TENMET)], [Online]. Available: http://www.tenmet.org/public_html/index.php?option=com_content&view=article&id=27&Itemid=65 [2011, 10/8/2011].
- TENMET 2007, 4 April 2007-last update, Identifying the issues [Homepage of Mtandao wa Elimu Tanzania Education Network (TENMET)], [Online]. Available: http://tenmet.org/public_html/index.php?option=com_content&task=view&id=18&Itemid=64 [2011, 10/8/11].
- Tesfu, M. & Magrath, P. 2006, *Briefing Note 9 - Equal access for all - 2*, WaterAid Ethiopia, Addis Ababa.
- Theunynck, S. 2002, *School construction in Developing Countries: What do we know?*, World Bank, New York, USA.
- Tietjen, K. 1999, *Community Schools in Mali: A Comparative Cost Study*, USAID, NY, USA.
- Uganda National Action on Physical Disability (UNAPD), Ministry of Gender, Labour and Social Development 2010, *Accessibility Standards: A Practical guide to create a barrier-free physical environment in Uganda*, Kampala, Uganda
- UN 2010, *The Millennium Development Goals Report 2010*, UN, New York, USA.
- UN Enable n.d., n.d.-last update, Factsheet on Persons with Disabilities. Available: <http://www.un.org/disabilities/default.asp?id=18> [2011, 13/4/2011].
- UN Water 2008, *Sanitation is an investment with high economic returns*, UN Water, Geneva, Switzerland.
- UNESCO 2010, *Education for All (EFA)- Global Monitoring Report (GMR): Reaching the marginalized*, UNESCO, Paris, France.
- UNESCO 1996, *Mid Decade Meeting fo the International Consultative Forum on Education for All* 16-19 June 1996, Amman, Jordan, UNESCO, Paris.
- UNICEF 2010, *Raising Clean Hands: Advancing Learning, Health and Participation through WASH in Schools*, UNICEF, Geneva, Switzerland.
- UNICEF Regional Office for South Asia 2009, *Equity in School Water and Sanitation: Overcoming Exclusion and Discrimination in South Asia*, UNICEF, Kathmandu, Nepal.
- UNICEF Sri Lanka 2009, *Child Friendly Schools*, UNICEF Sri Lanka, Colombo, Sri Lanka.
- UNICEF Tanzania 2002, *Situation Analysis of Children in Tanzania*, UNICEF Tanzania, Dar es Salaam, Tanzania.
- UNICEF, CCBRT & EEPKO n.d., *School WASH for All Children in Tanzania*, Tanzania.
- UNICEF, UMI & WEDC 2004, *Sanitation for those with special needs*, training materials, Uganda Management Institute, Kampala.
- UNSTATS 2001, *Guidelines and Principles for the Development of Disability Statistics*, UN, New York, USA.
- Uriyo, A. 2011, *meeting 17.6.11 Principal R&D Officer*, Contractor's Registration Board, Dar es Salaam, Tanzania.
- URT 2010, *The Persons with Disabilities Act*, Dar es Salaam, Tanzania.
- URT MoEVT 2011, *National Strategy on Inclusive Education 2009-2017*, Final draft 25 March 2011, URT, Dar es Salaam, Tanzania.
- URT MoEVT 2010, *Basic Education Statistics Tanzania (BEST)*, URT, Dar es Salaam, Tanzania.
- URT MoEVT 2007, *SEDP: Drawings for Provision of Physical Facilities in Secondary Schools*, Secondary Education Development Programme edn, Dar es Salaam, Tanzania.
- URT MoEVT 2004, *SEDP Technical Handbook*, Secondary Education Development Programme edn, Dar es Salaam, Tanzania.

Inclusive Primary Education in Tanzania: the role of Accessible Sanitation

- URT MoHSW 2011, *Sanitation and Hygiene Policy (Draft One)*, Ministry of Health and Social Welfare, Dar es Salaam, Tanzania.
- URT MoHSW 2010, National Guideline for School Water, Sanitation and Hygiene (SWASH) in Tanzania (First Draft for Piloting and Consultation), United Republic of Tanzania, Ministry of Health and Social Welfare, Dar es Salaam, Tanzania.
- URT MoLYS 2004, *National Policy on Disability*, National Policy edn, URT, Dar es Salaam, Tanzania.
- URT MoWLD, URT NBS, WaterAid & Eastern Africa Statistical Training Centre 2002, *Water and Sanitation in Tanzania: Poverty Monitoring for the sector using national surveys*, URT, Dar es Salaam, Tanzania.
- URT NBS 2009, *Household Budget Survey 2007 - Tanzania Mainland*, National Bureau of Statistics, Dar es Salaam, Tanzania.
- URT NBS 2008, *Tanzania 2008 Disability Survey Report*, National Bureau of Statistics, Dar es Salaam, Tanzania.
- Vahaye, G. 2011, *meeting 3.6.11 Special Education Officer Temeke Municipality*, Temeke Municipality, Dar es Salaam, Tanzania.
- various 2011, 2011-last update, Leonard Cheshire Disability & Inclusive Development Centre: Centre Publications [Homepage of University College London, UK], [Online]. Available: <http://www.ucl.ac.uk/lc-ccr/centrepublications> [2011, 14/6/2011].
- WaterAid 2007, *Sanitation and economic development: Making an economic case for the MDG orphan*, WaterAid, London, UK.
- WaterAid Madagascar 2010, *Accessibilite des infrastructures communautaires d'adduction d'eau potable d'assainissement et d'hygiene*, Technical briefing paper, Antananarivo, Madagascar.
- WaterAid Mali 2007, *All people, one goal, all access: Water and sanitation access for people with disabilities*, WaterAid Mali, Bamako, Mali.
- WaterAid Nepal n.d., *Creating user-friendly water and sanitation services for the disabled: the experience of WaterAid Nepal and its partners*, Kathmandu, Nepal.
- WEDC n.d., *Unit 10: Accessible Toilets - Considering the Needs of All*, Lecture Notes, Loughborough University, UK.
- WELL 2006, Briefing Note 36: Money Matters, Cost estimates, budgets, aid and the water and sanitation sector, WEDC, Loughborough, UK.
- WHO 2011, *World Report on Disability* WHO, Geneva, Switzerland.
- WHO 1981, *Disability prevention and rehabilitation (Technical Report Series 668)*, WHO, Geneva, Switzerland.
- WHO & UN Water 2010, *UN-Water Global Annual Assessment of Sanitation and Drinking Water: Targeting resources for better results*, WHO, Geneva, Switzerland.
- WHO & UNICEF 2010, *Progress on Sanitation and Drinking-Water: 2010 Update*, WHO, France.
- Wilbur, J. 2011, "Principles and practices for the inclusion of disabled people in access to safe sanitation: a case study from Ethiopia", *35th WEDC International Conference* WEDC, Loughborough University, UK, 6-8 July 2011.
- Wiman, R. & Sandhu, J. 2004, *Integrating appropriate measures for people with disabilities in the infrastructure sector*, Eschborn: GTZ, Germany
- World Bank 2007, *Social Analysis and Disability: A Guidance Note (Incorporating Disability-Inclusive Development into Bank-Supported Projects)*, World Bank, Washington, USA.
- World Bank, Water and Sanitation Program 2005, 2005-last update, *Toolkit on Hygiene, Sanitation & Water in schools* [Homepage of World Bank], [Online]. Available: <http://www.wsp.org/wsp/Hygiene-Sanitation-Water-Toolkit/BasicPrinciples/Dimensions.html> [2011, 5/1/2011].
- WSSCC & WHO 2005, *Sanitation and Hygiene Promotion*, WSSCC, Geneva, Switzerland.
- Zomerplaag, J. & Mooijman, A. 2005, *Child-friendly hygiene and sanitation facilities in schools: indispensable to effective hygiene education*, IRC International Water and Sanitation Centre, UNICEF, Delft, The Netherlands.

8. Appendices

8.1. Field Research programme

date	day	am	pm
25.5	W		Arrive DAR
26.5	T	WATz office, meet Advocacy Team	
27.5	F	UNICEF Tz office	CCBRT meeting cancelled
28.5	S	Write up notes	
29.5	S	R&R	
30.5	M	MoEVT meet Special Education Unit representative	CCBRT meet Advocacy Officer
31.5	T	Manzase Day Care & Disability Centre	Ukombozi PS
1.6	W	Hekima PS:	Mkwawa PS
2.6	T	Salvation Army School for Physically Disabled	Jangwani Girls SS
3.6	F	Temeke Municipal Authority	CCBRT
4.6	S	Start draft of field trip report	
5.6	S	Travel Dodoma	Travel Dodoma
6.6	M	Meet Regional Officers, Chamwino Acting Exec Dir, and Chamwino PS Education Officer	Buigiri Blind PS
7.6	T	Buigiri PS	Mkapa PS
8.6	W	Nyere PS	Mvumi PS
9.6	T	Makangwa PS	Mloda PS
10.6	F	Meet Dodoma Municipality Education and Special Education Officers Muyiji Cheshire Home	Write up notes
11/12.6	S/S		
13.6	M	Meet EEPKO Engineer collect BoQs, short interview	Try and make appointments for rest of week
14.6	T		SNV Tanzania - Interview
15.6	W	Plan International: Travel to Kisarawe, visit Kikwete PS	Return from Kisarawe
16.6	T	Discussion with WATz Urban Sanitation project officer	Ardhi University (ARU) interview with Env Lecturer Meet Ex-ARU student
17.6	F	CCBRT –discussion, update with Advocacy Officer	Visit ERB, CRB, AQSRB estimation ARU – meet QS lecturer, collect documents
18/19.6	S/S	First draft field report + Notes on NG SWASH	Mail drafts to WATz and cCBRT
20.6	M	MjiMpya PS	Plan International interview Water and Sanitation Engineer
21.6	T	HakiElimu Interview with Media Programme Manager	MoEVT Infrastructure Dept interview Engineer WA Tz discussion Water and Sanitation Technical Advisor
22.6	W	WATz+CCBRT debriefing	Fly out

8.2. Schedule of Schools visited, adults and disabled children met

8.2.1. Schools

School ID	Rural/ urban	School Authority	Inclusive (reg or unreg)	Special	Integrated	Other
S1	u	N/A				1
S2	u	Ilala, Dar es Salaam	1			
S3	u	Kinondoni, Dar		1		
S4	u	Temeke, Dar		1		
S5	r	Chamwino, Dodoma		1		
S6	u	Chamwino, Dodoma		1		
S7	u	Kinondoni, Dar	1			
S8	u	Kinondoni, Dar	1			
S9	u	Kinondoni, Dar	1			
S10	r	Chamwino, Dodoma			1	
S11	r	Chamwino, Dodoma	1			
S12	r	Chamwino, Dodoma	1			
S13	r	Chamwino, Dodoma	1			
S14	r	Chamwino, Dodoma	1			
S15	r	Chamwino, Dodoma	1			
S16	r	Kisarawe,	1			
S17	u	Temeke, Dar	1			

Not school

Secondary School

Special School

8.2.2. Disabled children interviewed

Student Initials	School Name				School type			Functional limitation				
		sex	age	class	Inclusive (reg or unreg)	Integrated	Special	physical	visual	hearing/ speaking	cognition	
AA1	Buigiri Blind	F	13	VI			1		1			
AC	Nyerere	M	9	I	1					1		
AR	Mloda	F	11	III	1				1			
AS1	Mkwawa	M	13	V	1				1			
CL	Mloda	F	11	IV	1				1			
CM1	Mkapa	F	13	IV	1				1			
EE1	Buigiri PS	F	19	C								1
FA	Jangwani	F	18	C				1	1			
GM	Mvumi	M	11	IV				1				
GN	Mloda	F	14	VII	1			1				
HC	Nyerere	F	8	I	1			1				
IM	Ukombozi	M	17	VII				1				1
JJ1	Buigiri PS	M	6	I		1		1				1
JM1	Mloda	M	12	IV	1			1				
JM2	Mkwawa	M	12	IV	1			1				
JM3	Mvumi	M	10	IV	1			1				
JN	Kwaka	M	11	V	1			1				
JP	Nyerere	F	12	II	1			1				
ML	Mvumi	F	13	VI					1			
MM1	Buigiri Blind	M	12	V			1		1			
ND1	Hekima	F		II	1			1				1
ND2	Hekima	F		I	1			1				1
ND3	Hekima	M		VI	1			1				1
NL	Mloda	F	9	II	1			1				
NN	Buigiri Blind	M	11	III			1		1			
PJ	Mvumi	1	13	V					1			
RR	Makangwa	F	15	DO	1					1		
SM	Mvumi	M	13	V					1			
SS1	Buigiri Blind	M	16	VII			1		1			
SS2	Makangwa	M	11	II	1			1				
TS1	Makangwa	F	18	C	1				1			
WY	Jangwani	F	15	C				1				
YM	Mvumi	F	9	IV	1				1			

C: completed PS

DO: dropped out primary school

8.2.3. Adults interviewed

Adult ID	School type					Profession					If teacher – qualification / experience		
	rural/ urban	Inclusive (reg or unreg)	Integrated	Special	Other	HT	Other teacher	Education professional (i.e. management)	Disability/ health professional	Water San professional	teaching cert	other qual	yrs teaching exp
AA2	r	y				y					3A		11
AK					y			y					
AS2	u	y					y						
AU													
BM	r	y					y						
BS	u	y				y							
CM2	r		y				y				Cert +Dip in Special Needs (1+2yrs)		5
CM3	u	y					y				BSc		26
DM	u			y				y					
DP	u			y		y							
DS	u	y					y				BSc		23
EC								y					
EE2	u			y					y				
EG	r	y				y							30
EM					y			y					
FF	u	y					y						
FI	u	y					y				teaching cert		7
FM					y				y				
FS	u	y					y				teaching cert		18
GV					y			y					
HK													
HT	u			y					y				
IR	r	y					y				3A		10
JM4	r	y				y					3A		25
JM5	r	y				y					3A		32
LC	u			y			y				special needs 1yr Patandi		6
MD	u	y				y							
MM2					y				y				
MM3	r		y			y					3B		36
MN	r			y			y				orientation+ mobility special needs course 1yr		32
MS	r		y				y						28
ND4	u	y					y						
ND5	r	y					y						
ND6	r	y					y						
NS					y			y					
PK	r	y					y						19
RB	r			y			y				y		18
SB					y				y				
SH					y				y				
TS2	r	y					y				3A		3
WM					y				y				

Key Informant

Secondary School

8.3. Physical audit compliance criteria in full

Category	Description	Criteria (source)	Comment
Proximity	Distance from furthest classroom	≤150m (NG SWASH)	
Route to latrines	Width	≤1.2m (NG SWASH)	
	slope	≤1:20 (NG SWASH)	
	Surface hazards	≤50mm (none)	
	Guidance		Handrail, kerb
	Secure route	Yes	Fenced or unfenced
	Used by outsiders	No	
Ramp/ steps	Width	≤1.2m (NG SWASH)	
	Slope (gradient)	≤1:20 (NG SWASH)	
	Length/ landings	1.2m landing/ 10m length (NG SWASH)	
	Steps	Height/ width ranges (Jones & Reed 2005)	Main issue is regularity of height+width
	supports	Handrail, kerb	
External Doors – latrine block	Doorway present?		
	Door present		
	Landing present	If door present, landing required ≤1.2mx1.2m	
	Door opens in or out	Outwards	
	Door can be opened by disabled child	Yes	
	Clear doorway width	≤900mm (NG SWASH)	
	Door handle height	900-1200mm (NG SWASH)	
	Door lock height	900-1200mm (NG SWASH)	
	Lockable by disabled child?		
	Disabled sign?	Large brightly coloured international symbol H=1500 (NG SWASH)	
Cubicle	Width	≤1500mm (NG SWASH)	
	length	≤2000mm (NG SWASH)	
	Clearance set to door	≤1500mm (NG SWASH)	
	Clearance seat to side wall	≤800mm (NG SWASH)	
	Clearance seat to back wall	≤300mm (NG SWASH)	
	Window dims		
	floor	Material, finish, slope	Washable, draining
Category	Description	Criteria (source)	Comment
Cubicle handrails	Diameter	50mm	
	Section	Round	
	Clearance from wall	≥150mm (NG SWASH)	
	Height	700-900mm (NG SWASH)	
	Length	1400-1650mm (NG SWASH)	
Seat	Present?		
	Material		
	Height	350 (NG SWASH)	
	Length	400 (NG SWASH)	
	O/A width	500 (NG SWASH)	
	Opening width	100 (NG SWASH)	
	Opening length	250 (NG SWASH)	
Anal cleansing material	Type?		
	location	In cubicle/ in latrine block/ outside/ none	
Hand washing water	location	In cubicle/ within 5m	
	Reachable by wheelchair		
	Height		
	Tape useable by disabled child		

8.4. Example of AA and interview records

Q2_Officials Q.doc

Ref	Name	Sector	Agency	Relevant School Field Visit	Job Title
					Teacher
			(Blind)		Teacher
					Mhunde full time not a contractor

Main Responsibilities (circle as applicable)			
Policy- Ed/ Health/ Water	Finance allocation - Ed/ Health/ Water	School Admissions	Construction Supervision
Regulation - Ed/ Health/ Water	Finance procurement - Ed/ Health/ Water (software-training)	School Management	O&M supervision
?? what else?	Finance procurement - Ed/ Health/ Water (hardware-constr)		

Specify
outside school, do you know any CWD/ PWD? are they in school/ did they attend school, age, grades achieved, reasons for leaving, can we meet them?
Anything else?
Other

School closed last Friday
Some students still around though

Class I-VII

There's another teacher who is involved in enrollment
boarding + day.

Teachers on duty make roles to clearing activities
by students.

Some issues about 'researcher effects' during this visit.

Mr Mpenba + Angela Myoga on Chamwino District
Council had a bit of a disagreement
which may have influenced responses from
teachers there.

When asked about barriers to teaching children - the teachers said
lack of braille books. Ms Myoga disagreed saying there were books.
Mr Mpenba said it was their interview so they should say what
they thought was correct.

Date 6.6.11 School [redacted] 1/2

Faith + Mpenba translate
conducted in English / mixed English +
+ Swahili / Swahili

Q10 School Teachers.doc

Q10 SCHOOL TEACHERS

1	your level of education/ experience? qualifications, no. years teaching, no. yrs teaching CWD, type schools, any CWD training
2	do you teach any CWDs, how many, how many in school, nature of disability, grade/ ages, gender
3	what barriers do you face as a teacher teaching CWDs, lack training, knowledge, resources, class size
4	what barriers do you see these children have? social attitudes (family, community, students, teachers) physical (reaching school, in school, toilets, water) env (cost, time)
5	outside school, do you know any CWD/ PWD? are they in school/ did they attend school, age, grades achieved, reasons for leaving, can we meet them
6	Anything else you would like to discuss?

District Ward School Teacher Name M/F

Since 1979 Special Teacher since 1993 Mkwaka - Teacher Training College
Diploma + Mobility Graduate Teaching Certificate
Arusha Training College 2yrs

@ [redacted] - since 1992 since 1993

Disability CWDs Total students 92

Albino	7
Visually impaired / low vision	19
Total Blind are the majority	35 - residential
rest	31 no disabilities - day students

Most of the problems are in the classrooms, main problem is books, braille books. We don't have braille books for the current curriculum (researcher effect). Mrs Angela disagreed they have books. Teachers don't agree - they are the old books, not braille books for new curriculum.

Date 6.6.11 School [redacted] 1/2

Q10 School Teachers.doc

SWASH mapping data
 21 teachers - 8F, 13M
 25 teachers - 16 M, 9 F
 Teachers - 14 visually impaired

The non disabled teachers have to read it to the visually-impaired teacher who makes their notes with Braille typewriter & then teachers the class.

Sometimes he asks a student to read the book so he can teach.

The Specialist Training is very useful, but not everybody goes on this training @ Morogoro or Ordealia, Mobility. Most of the time the teachers come back & share with the others. 3 teachers attended the seminar held by Sight Savers Tanzania, with teachers from all over Tanzania, PS-SS.

Main challenges - awareness and attitudes of parents to education. The best even if students attend school, nothing good will come out of it.

The govt is helping pay school fees for residential students + the families don't pay any contribution.

No problem of children being abandoned at school. There is a budget for teachers to take the students home. govt & there is a fund for the student to come back (not accompanied).

The non-disabled students don't cause any problem for CWDS one in school.

There are sessions where the teachers tell the non-CWDS to help their fellow students & should love them & this continues throughout the school curriculum.

Newly students are assigned a non-CWDS mentor to take care of them till they know their way around the school.

No problems of bullying etc! Most of the able bodied students are teachers children, 2/2 so no problems, you wouldn't please your father so why treat your peers.

Q3_School demographics.doc

ID	School Name	Village		
	District	Ward		
	Interviewees	Role		
	Interviewees	Role		

type	School type	govt	church	private	community	
		rural	urban	peri-urban	flat	hilly

students	Student info	Boys	Boys with Disability	Girls	Girls with Disability
	Students (all)				
	Pre-primary				
	Primary				

teachers	Teachers	Male	Male with Disability	Female	Female with Disability
	Teachers (all)				
	Pre-primary				
	Primary				

grade	enrolment				Attendance 2010	Pass rate 2010 %	Fail	
	Age	Boys	Boys WD	Girls			Girls WD	Repeat %
Level I								
Level II								
Level III								
Std I		CWDS 36		CWDS 25				
Std II		5 Albino		2 Albino				
Std III		18 total blind		17 total blind				
Std IV		13 low vision		6 low vision				
Std V								
Std VI		non-CWDS 17		14 non-CWDS				
Std VII								
Form I		53		39		854	944	
Form II								
Form III								
Form IV		292				298		
Form V								
Form VI								

A

Date 6.6.11

School [redacted]

Inclusive Primary Education in Tanzania: the role of Accessible Sanitation

Q4_CWD details.doc

Class - 3 totally blind at school - signs to Jy/s-

ID	Name	Age	School Name
	[redacted]	[redacted]	[redacted]
	Years schooling	Start age	
	11	8	

Coding based on 2008 URT Disability Survey (circle applicable)

Deformed limbs	B	High blood pressure or heart problem	L
Deaf or hard-of-hearing	C	Epilepsy	M
Blind or low vision	D	Tuberculosis	N
Paralysis of one or more limbs	E	Arthritis	O
Amputation or loss of one or more limbs	F	Psychiatric illness	P
Head injury/ trauma	G	depression	Q
Brain damage (stroke, encephalitis, meningitis, hydrocephalus etc)	H	Albinism	R
Cerebral palsy	I	Other illness (specify)	S
Asthma or breathing problems	J	Other injury (specify)	T
diabetes	k		

Coding based on 2010 BEST report (circle applicable)

Deaf	Physically impaired	Mentally impaired	Multi impaired	Other
Deaf/ blind	Visually impaired	Autism	Albino	

Extent of impairment

Delete as appropriate	Can climb steps with /out support
Can 'walk' with /out support?	Can grasp handle/ handrail
Can stand with/ out support	Can turn lock/ handle
Can squat with /out support	Can turn tap

Categories based on 2008 URT Disability Survey

Do you use any of the following aids? (tick all applicable)

Information	Telescoping lenses
Eye glasses	Large print
Hearing aid	Braille
Magnifying glass	Portable writer
Communication	Computer
Sign language	White cane
Fax	Guide
Personal mobility	Standing frame
Wheelchair	
Crutches	
Walking stick	

Any problems using them, specifically around school? Broken, wrong size, wrong prescription, worn out

New Boys block was not there when they first arrived

What would you prefer instead? (not promising anything), how would this make a difference? - water within blocks compared to before, the squat pan one better than the drop holes - like the flush. with drop holes, easy to fall in.

Date 6.6.11 School [redacted] 1/2

Q4_CWD details.doc

Everyone has Toilet at home tho live in rural areas All the latrines - but all prefer the new latrine type at school

Coding based on 2008 URT Disability Survey

Circle those which apply Insert reason code L, M, A Then rank (1-critical)

Reason	code	rank	reason	code	rank
One graduate wasn't convinced that school would take of him - but school wrote to the family & they had to send them	00		But [redacted] + [redacted] parents look them to school		
Too young / completed school	01		Married/ engaged	11	
Too far away	02		Too many kids/ after siblings	12	
Failed to pay contribution i.e. fees or other costs	03		Scared teachers	13	
Working at home	04		(parent) not willing to send children to school	14	
Working for payment	05		(parent) not willing to send female children to school	15	
Useless/ uninteresting	06		Other (specify)	16	
Illness/ disabled	07*		Refused entry by school		
Pregnant	08		Attitude teachers		
Undisciplined	09		Attitude other students		
Divorce/ separation of parent	10		Didn't think were allowed		

Reasons for not attending school

Concerns about coming to school

initially worried about new people, [redacted] family cultural background, religious, what would happen if he falls sick as dad (Rank 1-critical) is not around.

wasn't people wouldn't speak kiswahili, At home parents are used to take care of them but was warned no one would do that here.

What would make it easier to enroll/ attend school more?

School Fees	code	rank	Attitude teachers	code	rank
Unofficial fees - exams, books			Attitude other students		
School uniform money			Attitude parents		
Lunch			Attitude community		
Transport			Teaching materials for CWSN		
School infrastructure - accessible			Teachers trained to teach CWSN		
School infrastructure - condition			Other		
School infrastructure - sanitation					
Healthcare in general					

What do you want to be when you grow up? (Rank 1-critical) [redacted] - Member of Parliament

Reasons for not using latrine Critical/ desirable

Latrine too far	code	rank	Cubicle door not OK	code	rank
Path too difficult - terrain			Cubicle door not lockable		
Path not clear - route			Cubicle too dark		
Path not secure - outsiders/ students			Cubicle too small		
Latrine too near boys/ girls latrine			Seat not OK		
Ramp not OK			Handrails/ other supports not OK		
Steps not OK			Smelly, dirty		
No landing			No anal cleansing materials		
No external handrail			No hand washing facility		
External door not OK			No menstrual hygiene facility		
Other					

[redacted] - Politician

Q5_Accessibility Audit.doc

Coding as SWASH Toolkit 1A Latrine Standards	A3 Latrine type						
	Traditional Pit latrine		Pit latrine with washable slab		VIP/ pour flush/ composting	Other	
	0		1		2		
	Comments Walls: HCB Floor: cement Roof: tin Windows: bars + mesh Vent pipe- position, ht above roof, clear to sky/ sun, fly gauze Latrine Slab - material						
	Latrine materials			Cement/ concrete/ burnt brick			
	0			1			
	Comments						
	Suitable for disabled			Yes			
	0			1			
	Comments						
	Privacy for girls		Neither	Door, but no privacy	Yes, but no door	Yes, and door available	Door lockable from inside (Toolkit 1B)
	0		1	1	2	2	
	Comments Note door height, clearance above +below lockable						
	Privacy for boys		Neither	Door, but no privacy	Yes, but no door	Yes, and door available	Door lockable from inside (Toolkit 1B)
	0		1	1	2	2	
Comments Note door height, clearance above +below lockable							
Latrine emptied		No		Yes			
0		not yet happened		1			
Comments							
Latrine standards overall score							
D		C		B		A	
0-2		3-5		6-7		8-9	
Very poor		poor		OK		good	

Q5_Accessibility Audit.doc

Coding as SWASH Toolkit 1A Latrine hygiene & hand washing	A4 (Anal) Cleansing materials		No materials present		Materials present			
	0				1 water in containers			
	Comments Type, freq replenished, by whom, paid for by?							
	Water for handwashing		No water	Insufficient Water	Sufficient water	Toolkit 1B standard 1:50 students		
	0		1	2				
	Comments 'sufficient'?-flow Source, condition, drainage							
	Soap available? Or ash		No		Yes			
	1				2			
	Comments							
	Disposal of hygienic pads		No		Yes			
	0		using pit latrine which have adapted - using bought + clothes also wait g in showers + drying outside		1			
	Comments							
	Cleanliness							
	SWASH score		Either smelly, soiled		Neither Smelly or soiled		Not smelly, soiled or dirty	
			Inside	Outside	Inside	Outside	Inside	Outside
		0		1		2		
		Inside	Outside	Inside	Outside	Inside	Outside	
SWASH Toolkit 1		Faeces/ cleansing materials present		Standing water/ urine present		No materials present		
0				1		2		
Comments SWASH scoring unclear- score with both, flies?								
Latrine hygiene overall score								
D		C		B		A		
0-2		3-5		6-7		8-9		
Very poor		poor		OK		good		

This was a SWASH Mapped school 2555

There are stairs to classroom + hostel
 steps to toilets - no ramps
 new toilets - cubicle doors narrow
 bolts v small
 step to squat pan
 no seats, no supports
 old toilets - big steps / - a spiral not suitable w/char, difficult to use
 School uses - no supports. v. dark 2/10

Date

Q5_Accessibility Audit.doc

A5	Water Supply type	Unprotected/ none 0	Other protected 1	Piped 2
	Comments	intermittent + low pressure		
	Water Supply location	Off premises 0	On school premises 1	
	Comments	well not working		
Coding as SWASH Toolkit 1A Water Supply	Water Supply functionality	Non functional 0	Functional 1	
	Comments	intermittent + low pressure		
	Water supply overall score	1 tap by 5 toilets / 1 tap by parade ground. 1 tap by 2 toilets / 2 outside toilets		
	D	C	B	A
0	1-2	3	4	
Very poor	poor	OK	good	
A6	Hygiene teaching	Not taught 0	Taught 1	
	Comments	Type, freq replenished, by whom, paid for by?		
	Teacher trained in hygiene education	No 0	Yes 1	
	Comments			
Coding as SWASH Toolkit 1A Hygiene education	Teaching materials available	No 0	Yes 1	
	Comments			
	Hygiene education overall score			
	D	C	B	A
0	1	2	3	
Very poor	Poor	OK	good	
Comments	Latrine Numbers			
	Latrine Standards			
	Latrine hygiene & handwashing			
	Water Supply			
	Hygiene Education			
	Overall Score			

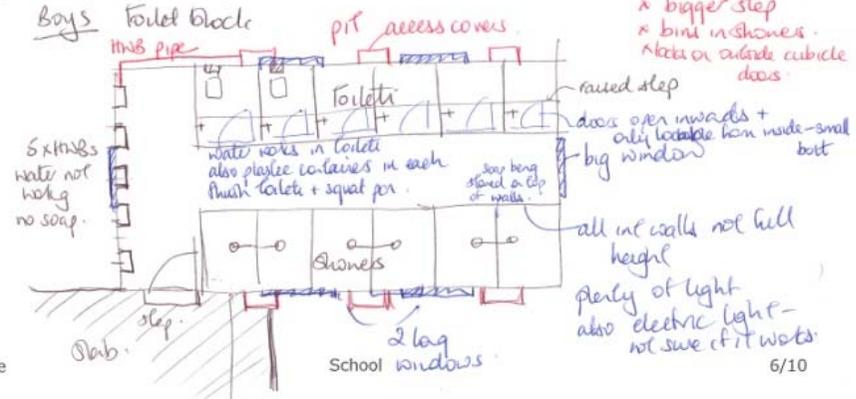
Q5_Accessibility Audit.doc

Suitable for Disabled?

classrooms in quad. class → kitchen

Proximity	External Access					Target	
	distance to latrine from	>150m	100-150	50-100	10-50	0-10m	SWASH <150m school >50m from water >10m boys/girls
	Nearest class	0	1	2	3	4	
	Furthest class	0	1	2	3	4	
comments	beneficial? - to which CWDs? Redundant? but some dist from classrooms.						
Path to latrines	Width	<1000mm 0	1000-1200 1	1200-1800 2	>1800 2	SWASH 1200-1800	
	comments	Check actual width local wheelchair design, turning circle etc					
	Slope	>12% (>1:10) 0	8-12% (1:12-10) 1	6.6-8% (1:15-12) 2	5-6.6% (1:20-15) 3	<5% (<1:20) 4	SWASH 1:20
	comments						
	Path Surface/ trip hazards (visually impaired)	Solids > 100mm Veg > 1000mm 0	Solids > 50mm Veg > 500mm	Solids > 20mm Veg > 150mm	X		
	comments	O/head obstructions? uneven earth roads around school - wide enough					
guidance	None 0	Rope/ handrail 1	Kerb/ edging stone 1	Edging + handrail 2	X		
comments	R-rail height (700-900mm), drainage						
Location - path + latrine	Unsecure route 0	Secure route unfenced 1	Secure route Fenced 2		X		
comments							
security	Latrines used by outsiders 0	Latrines accessible, but not generally used by outsiders 1	Latrines not used by outsiders 2		X		
Comments							

Sketch - external. (plan, elevations, direction classrooms, accessible/ normal cubicles, water, suggested changes - PHOTO NO.S)



Inclusive Primary Education in Tanzania: the role of Accessible Sanitation

Q5_Accessibility Audit.doc

Width	<1000mm 0	1000-1200 0 1170	1200-1800 1	>1800 2	Toolkit 2 1200-1800
comments	grip to back boys down.				
Slope	>12% (>1:10) 0	8-12% (1:12-10) 0	6.6-8% (1:15-12) 0	5-6.6% (1:20-15) 01	<5% (<1:20) 2 Toolkit 2 1:20
Comments	no ramp				
Ramp length + layout	<10m long 1	>10m, no landing/ landing < 1200 0	> 10m, landing >1200 1	Toolkit 2 10m c/c	
comments	Firm/sturdy, longevity, maintenance, even + slip resistant Ground surface indicators - top/ bottom, tactile for visually impaired 600mm				
Steps	No. steps Going <350 Max 12		Riser (height) Going >350 Max 18	Going (depth) 150-170	Guidance dims WEDC 440
Guidance	Max 12		Max 18	150-170	280-420
Actual meets guidance?	N	Y	N	Y	N
Comments	no. steps, sturdiness/ broken, width, surface finish				
Supports	none		partial	Full length	
Handrail	0		1	2	
kerb, wheelguard	0		1	2	
Comments	dims, dia, ht, sturdiness				

Ramp/ steps

Doors	Ext Doorway N	External Door Y	Int Doorway N	Internal Door Y	SWASH standard Ext door only
Landing outside door?	N	Y	N	Y	Yes
Comments	step no corndr 1300 - shared shower + toilet				
Opens directional to corridor?	N	Y	N	Y	Yes
Comments	opens inwardly				
CWD openable?	N	Y	N	Y	
Comments	at ht normal, not CWD height.				
Open direction	Int	Ext	Int	Ext	Outwards
Comments					
Door handle ht	Int 1140	Ext 1140	Int 1120	Ext none	Ext+ Int H=900-1200 ± 20mm Y=1, N=0
Comments	back no handles only back horn inside				

Doors

Q5_Accessibility Audit.doc

	External Door		Internal Door		Internal H=900-1200
Door lock ht	Y	N	Y	N	
Comments	see as "handle"				
CWD lockable?	Y	N	Y	N	
Comments					

	External Door		Internal Door		
Landing width	step in way				1200
Landing length					1200
Comments					

'Disabled' sign	colours none	symbol	Lettering height	Sign height	Large brightly coloured intl symbol H=1500
-----------------	-----------------	--------	------------------	-------------	---

	Ext Doorway	External Door	Int Doorway	Internal Door	
Door width		900		540	900
Doorway ht		2230		to roof	2000
Door ht		2230		1650	1800
Floor clearance		0		20	100
Comments	too narrow for wheelchair				

Door

	Width	Length	Min dim between open door and seat	Min clearance seat to side wall	Min clearance seat to back wall	
	1500	TK 2 1800 p57 2000? p58	1500	TK2 500 to c/ seat? P58 G/line 800 p35	TK2 300	SWASH G/line ± Toolkit 2
Accessible cubicle	950	1750	1150	400 one side		
Standard Cubicle				slightly offset		
Comments	too narrow for wheelchair					
Lighting	Window dims 200x?	Height from floor ??	Window material none	Lighting level (door closed) lux 160	window	Drq illegible
Comments	lots of light + back mesh					
Floor	Material, finish, slope, foot rests concrete ceramic squatt g per					
Comments	SWASH?? g/line illegible drq					

Cubicle

Q5_Accessibility Audit.doc

Cubicle Handrails	handrail	dia	section	Clearance from wall	H	L	finish	
Guideline		50	round	50? p53 TK2 150 p58	700-900	1400-1650		SWASH Toolkit 2
actual								
comments								

	permanent	temporary	Stool/ chair	Supports material	seat material	
Accessible cubicle						
Standard Cubicle						

	height	length	O/A width	Opening width	Opening length	
	350	400	500	100	250	SWASH
Accessible cubicle						
Standard Cubicle						
comments						

Anal cleansing materials	Material preferred	water	Soft <i>toilet paper</i>	hard	Other
	Location	In cubicle	In latrine block	Outside latrine	none
Disposal facility	In cubicle	In latrine block	Outside latrine	none	
Replenished by school?	daily	weekly	No sched	no	

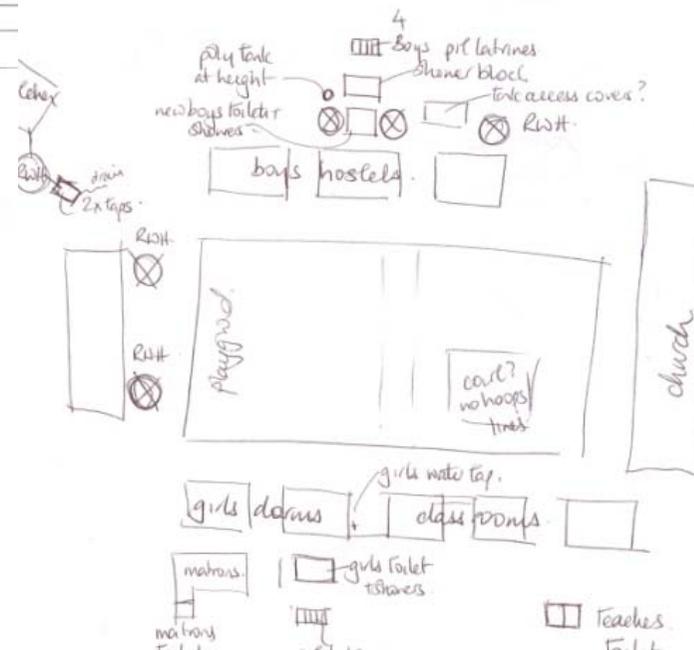
Sketch - internal. (plan, sections, accessible/ normal cubicles, water, suggested changes PHQTO NO.S)

Q5_Accessibility Audit.doc

Handwashing water	Within cubicle	Within 5m latrine block	Reachable by wheelchair	Support adjacent	Height tap above GL	Tap useable by CWD	SWASH Within latrine block
	N	Yes	1500 turning space	no	500		
comments	Can be reached from sitting, distance from latrine						

Menstrual hygiene facilities	No menstrual hygiene cubicle	Combined menstrual hygiene/ latrine cubicle	Designated menstrual hygiene cubicle
	0	1	2
Private	Y	N	
Lockable door	Y	N	
Water	Y	N	
Pads/ cloths	Y	N	
Drying	Y	N	
Disposal	Y (type)	N	
comments			

Sketch (height, reach, taps, suggested changes PHOTO NO.S)



Q6 knowledge attitudes to disability.doc

Q6 KNOWLEDGE/ ATTITUDES TO DISABILITY

1	Do you have any experience of people with disability or difficulty? Give brief details – relative, neighbour
2	If not, what is your main source of information about disability? People in the community, news, government/ DPO campaigns,
3	What kind of disability can you think of (range of definition)
4	What is your general feeling about disabled people? Benefit/ drain on society What do you think when you see them? Should families be ashamed, keep them indoors
5	Views on different types of disability?
6	People with difficulty, rather than disability – elderly-not mobile/ visually impaired, tall, pregnant, injured, sick, albino
7	What is your view on the causes of disability? Fate, injury, witchcraft
8	Do you know anything about the prevalence of disability is in Tanzania? In this district, this ward, this community
9	Anything else you would like to talk about?

(U) Has a relative who is blind, her nephew. Was already a teacher, then changed to this post to teach.

(R) Father was a social worker, Mum was a housewife. Father had no interest in sending him to school, but his mum died & since he had chance of education, he feels he should educate others.

(U) Radio - mtg PWDs to call in - News or broadcast. Names are here because of their vision problem, not because of attitude at home - some have severe vision problem.

There are no students with long term illness.

For those who don't go to SS, need vocational training. It is for all students who are not accepted.

Any experience of leading students with learning disabilities - All students differ, some are slow, some are fast. We have some of them who have difficulty in learning - so they repeat the class & some become good. But there are a few who don't continue with school. So they don't go to SS when they reach ST VII, & should go to vocational training.

Date 6.6.11

School

1/2

Q7 Attitudes to inclusive education.doc

Q7 ATTITUDES/ KNOWLEDGE ON INCLUSIVE EDUCATION

1	What are your views on inclusive education? Is it a good or bad idea? why
2	What is your feeling about the ability of disabled people to get education? Primary/ secondary/ tertiary
3	What is your feeling about the right of disabled people to get education? Awareness of UN HR Convention, Rights of the Child
4	What is your feeling about the responsibility of authorities to provide education for disabled people? Knowledge of Disability Act
5	Do you know if the government has policy on inclusive education?
6	Are there any targets/ goals/ strategy?
7	What are current policies on child enrolment?
8	What are current policies on enrolling CWDs?
9	What are the challenges facing your organisation to preventing these policies being implemented? Other priorities, resources – cost/ training, skills
10	What is the current reality about enrolment of CWDs?
11	Do you know what the education options are for CWDs? Mainstream, inclusive classes, special school
12	In your experience, how easy is it to get into these options
13	What are consequences for parents for failing to enrol their children?
14	What barriers do you see CWD have in accessing education? social attitudes (family, community, students, teachers) physical (reaching school, in school, toilets, water) env (cost, time) What are the biggest barriers to education for disabled children in your opinion?
15	What could be done to make the local school more accessible to CWDs?
16	What barriers do you think teachers face teaching CWDs, lack training, knowledge, resources, class size
17	What could you do to make the local school more accessible to CWDs?
18	outside school, do you know any CWD/ PWD? are they in school/ did they attend school, age, grades achieved, reasons for leaving, can we meet them
19	Anything else you'd like to discuss? Disability survey, next year's census Q etc??

Treated as a special school, able bodied student must be staff's children (teacher + other staff).

There are benefits & difficulties in all the types of school. In special schools, child get attention from teacher + can concentrate.

Difficult in ^{special} ~~mainstream~~ schools - easy for teacher to concentrate on able students & forget those with CWD.
Normal schools - 45/class
Integrated 35 - 30 normal, 5 CWDs

Date 6.6.11

School

Special schools only 5 students/class. 1/

Q7 Attitudes to inclusive education.doc

But here there are more than 5 students CWD as well
 1 student CWD = 9 students w/o disability

as students w/o disability

There is also lack of classrooms, not just teachers

8-4 pm school day

Know of legislation that all students should go to school.
 "Article 26" -
 Teachers not aware of any laws specifically for disabled students

Not aware of any consequence for not enrolling a child in school

not aware of any child who was refused enrollment due to disability

Most of the time the parent is referred to this school

If a physically disabled student came here, they would refer to Dar-es-Salaam to Yombo school - this is a vocational training school so not the right school (Mr Mlewa clarifies)

The environment is not friendly for phys disability, there are stairs, classrooms, hostel + bathrooms
 But a visually impaired student could step on a child who crawls. But equally they could step on a visually impaired student

Braille paper is very expensive: & duplicating braille papers + machines for copying

Date

School

2/2

Q8 funding for school latrines.doc

Q8 SCHOOL FUNDING FOR LATRINES

1	Who is responsible for school infrastructure - finance/ design
2	Who is responsible for school sanitation - finance/ design
3	What funds/ grants etc can be accessed?
4	How is most of school infrastructure actual funded in your experience?
5	Do you know if the government has policy on inclusive infrastructure/ sanitation?
6	Are there any targets/ goals/ strategy?
7	Do you know of any school latrines which have been built recently?
8	Do you know if the needs of CWDs were considered? How? Suggested by whom?
9	Where did they get technical guidance? Govt, community, DPO, NGO
10	Do you know how much the latrines cost? Would you be able to help me access the relevant documents so I can calculate the cost? Particularly of the accessibility features
11	Do you know any organisations which support school latrines?
12	Do you know any organisations which support education for CWDs?
13	Anything else you would like to talk about?

Toilets for day time & toilets for hostel are same

10 B. } all in hostel areas, split up
 6 A.

Old - not sure
 New ones 2004 - paid for by DCA through by contractor

'Normal' toilets, no special facility to find the toilets
 squating pens

Mr Bwana uses his foot to hit the toilet

Squating pens better, seat toilets not liked because they are dirty

Ceramic squat pens in use - pour flush, does not need much water. There is a shortage of water & perception is that squat pen uses less water

But if child can't see, how do you know if they peed on floorplates or if they cleared the pen when they finished

There are ^{one} school takers / monitors + persons check throughout the day + also non-CWDs

Toilets go to septic tank - has not got hit since they were built

Date 6.6.11

School

1/2

8.5. Defining 'standard' and 'accessible' elements of latrines

8.5.1. Modified WEDC design

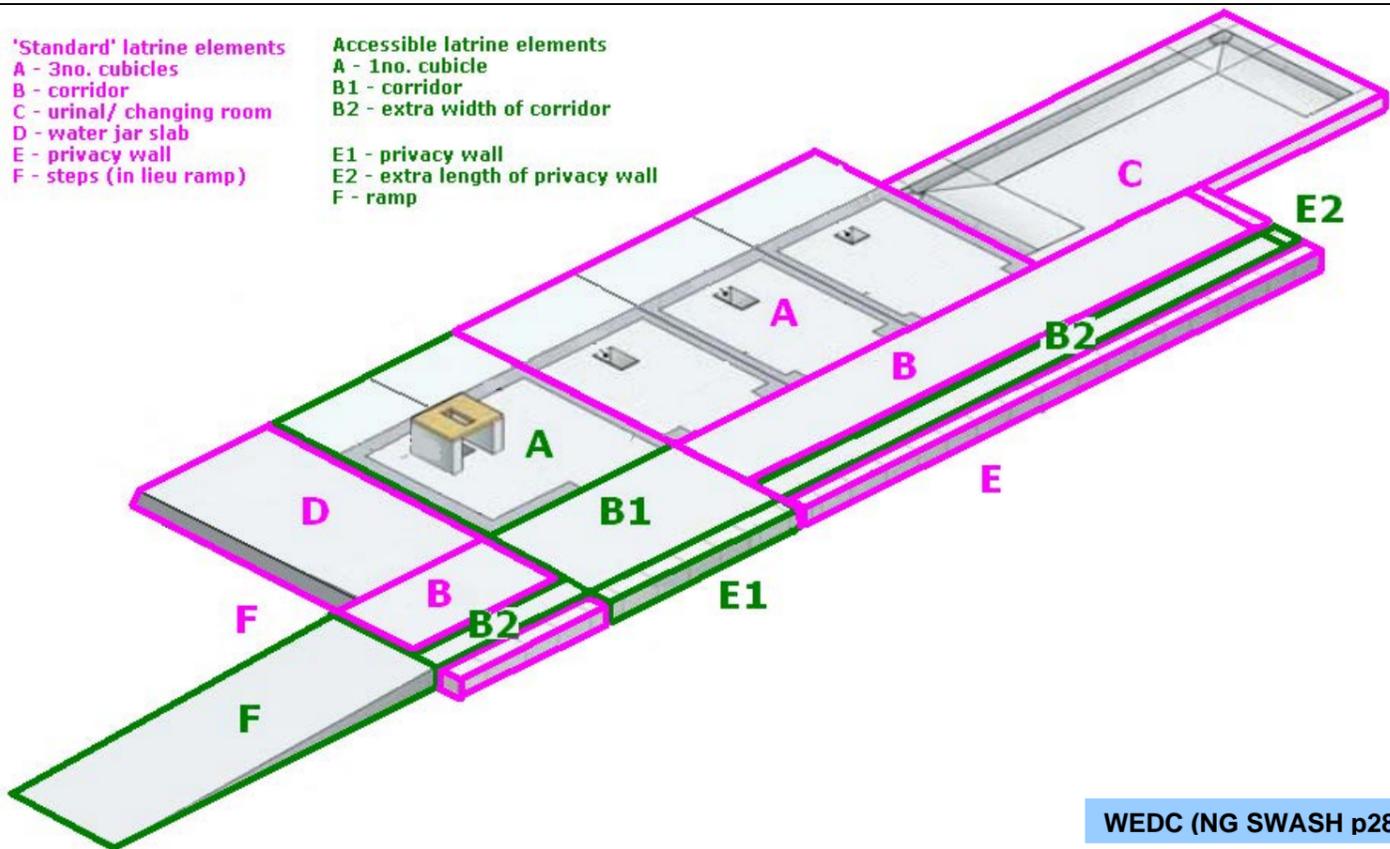
design

Assumptions/ adjustments made during cost estimate
 Due to drawing dimensional errors:

- All cubicles 1.5m long
- Standard cubicles 1.2 wide internally
- Accessible cubicle 1.5m wide
- Other dimensions corrected to suit including
 - Retain overall pit size
 - Access pit covers – 1no, 450mm wide
- Pit beams and slabs cast in situ, not precast
- 3m deep pit
- Slabs raised 2 courses above EGL
- Ramp at 1:20
- Handrails single straight sections – not bespoke
- Roof assumed as SEDP drg SDP/12D/02

'Standard' latrine elements
 A - 3no. cubicles
 B - corridor
 C - urinal/ changing room
 D - water jar slab
 E - privacy wall
 F - steps (in lieu ramp)

Accessible latrine elements
 A - 1no. cubicle
 B1 - corridor
 B2 - extra width of corridor
 E1 - privacy wall
 E2 - extra length of privacy wall
 F - ramp



WEDC (NG SWASH p28-50)

8.5.2. Modified MoEVT design

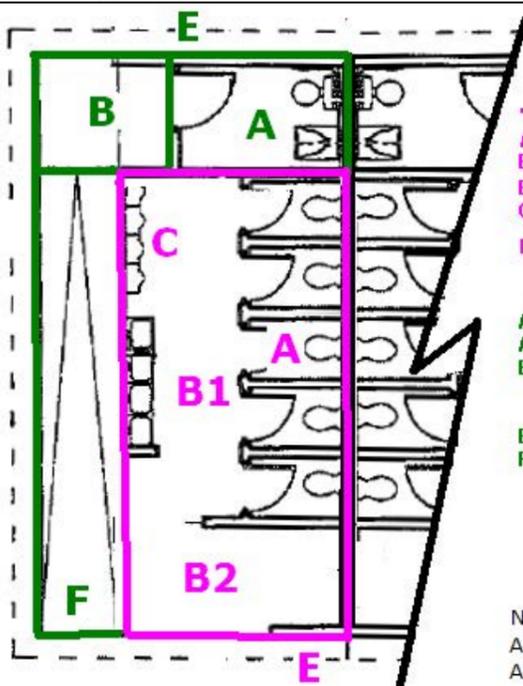
design

Only 1 MoEVT drg in NG SWASH accessible and for hostel so includes showers, laundry facilities etc. Therefore have used alternative MoEVT SEDP design for smaller accessible block.

Assumptions/ adjustments made during cost estimate

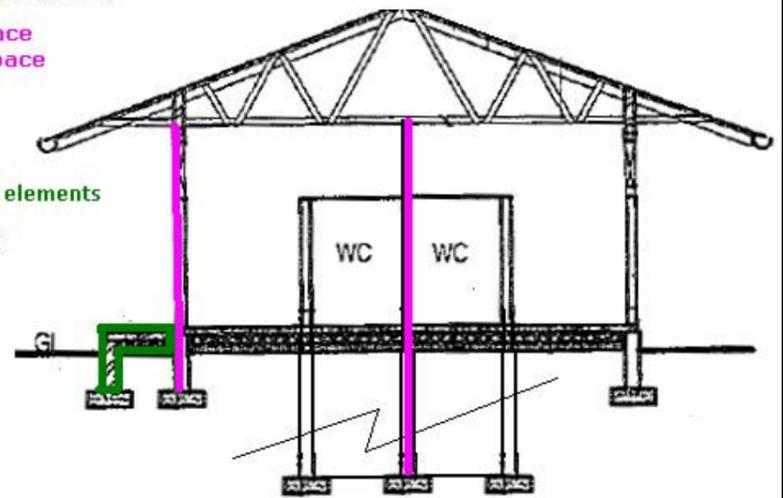
Design was for PF latrine, but have assumed pit latrine as do not have BoQ rates

- handed cubicles
- assumed lined pit
- Urinals assumed concrete step, not ceramic
- Slabs raised 1 course above EGL
- Seat + handrails single straight sections incl accessible cubicle
- No HWB costed



'Standard' latrine elements
 A - 5no. cubicles
 B1 - corridor space
 B2 - entrance space
 C - urinals
 E - walls

Accessible latrine elements
 A - 1no. cubicle
 B - corridor space
 E - walls
 F - ramp



Notes:
 Assume cubicles central to latrine
 Assume 2 accessible cubicles provided

assumed pit arrangement

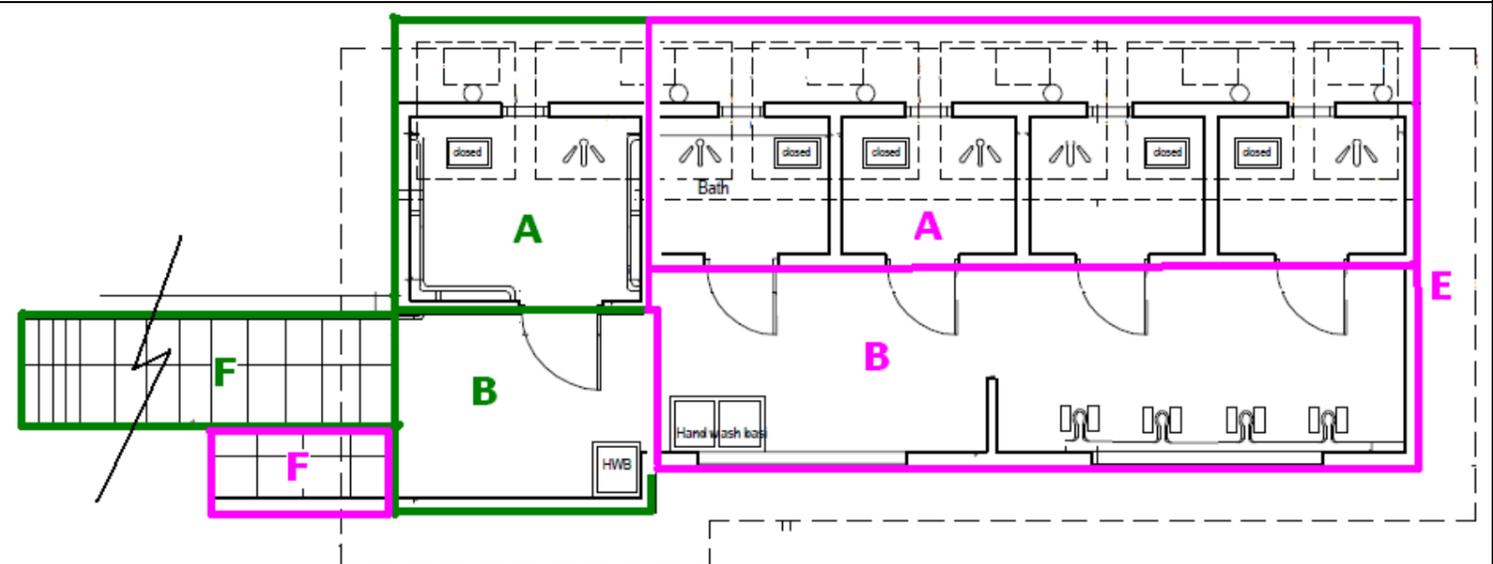
MoEVT SEDP Drgs SDP/11AD/01-04

8.5.3. EEPCO design

Selected Double vault pit from 2 EEPCO latrine designs in NG SWASH

Assumptions/ adjustments made during cost estimate

- Standard cubicle int dims vary – assumed 4 at 1920
- Ramps slope at 1:20
- 2 seats + handrails single straight sections incl accessible cubicle
- No HWB costed



'Standard' latrine elements
 A - 4no. cubicles
 B - corridor, incl urinals
 E - privacy wall
 F - steps

Accessible latrine elements
 A - 1no. cubicle
 B - corridor
 E - privacy wall
 F - ramp

EEPCO Double Vault Girls DVVIP1(NG SWASH) TK 2:2 p61-

8.7. Detailed comparison of Extra Cost of Accessibility

WEDC (NG SWASH p28-50)						Per m2		Notes on results
Standard components	Accessible components	Total	Complete latrine block with accessible components	Equivalent block with only standard cubicles	Standard	Accessible		
no. cubicles	3	1		4				pit is larger than standard pit, handrails and seat provided widened corridor allows access to urinal/ changing room no hardcore
cubicle floor area	1.80	2.25						
A - cubicles		A - cubicle						
	4,368,778	2,043,899		5,825,038				
B - corridor		B - corridor						
	326,962	159,182		435,949				
C - urinal				1,559,076				
D - water jar slab				163,552				
E - privacy wall		E- privacy wall		848,966				
F - steps		F - ramp		95,605				
total	6,696,139	2,529,837	9,225,976	8,928,185	1,240,026	1,124,372		
per cubicle	2,232,046	2,529,837						
	<u>cost accessible</u>	<u>cost standard</u>	27%	E/O % accessible 4 cubicle block non-accessible 4 cubicle block	3.34%	<u>Standard /m2</u>	<u>Accessible /m2</u>	91%
		113%						
MoEVT SEDP Drgs SDP/11AD/01-04								
Standard components	Accessible components	Total	Complete latrine block with accessible components	Equivalent block with only standard cubicles	Standard	Accessible		
no. cubicles	5	1		6			pit is larger than standard pit, no handrails or seat provided, no access to pit cost of urinals, HWBs + plumbing not included in estimate N/A no step equivalent as shown only 1 course above EGLramp laid on hardcore	
cubicle floor area	1.43	4.21						
A - cubicles		A - cubicle						
	14,112,429	4,282,410		16,934,915				
B - corridor		B - corridor		1,947,598				
C - urinal				99,549				
D - water jar slab				0				
E - privacy wall		E- privacy wall		8,062,217				
F - steps		F - ramp		0				
total	22,536,899	5,691,943	28,228,842	27,044,279	3,163,074	1,352,809		
per cubicle	4,507,380	5,691,943						
	<u>cost accessible</u>	<u>cost standard</u>	20%	E/O % accessible 4 cubicle block non-accessible 4 cubicle block	4.38%	<u>Standard /m2</u>	<u>Accessible /m2</u>	43%
		126%						
EEPCO Double Vault Girls DVVIP1(NG SWASH TK 2:2 p61-67)								
Standard components	Accessible components	Total	Complete latrine block with accessible components	Equivalent block with only standard cubicles	Standard	Accessible		
no. cubicles	4	1		5			pit is larger than standard pit, handrails and seat provided cost of HWB+ plumbing not included in estimate N/A includes kerb and handrail for full length one side, ramp laid on hardcore	
cubicle floor area	2.82	5.00						
A - cubicles		A - cubicle						
	8,109,825	3,174,074		10,137,282				
B - corridor		B - corridor		851,860				
C - urinal				0				
D - water jar slab				0				
E - privacy wall		E- privacy wall		1,235,976				
F - steps		F - ramp		206,485				
total	9,945,282	4,825,039	14,770,321	12,431,602	881,674	965,008		
per cubicle	2,486,320	4,825,039						
	<u>cost accessible</u>	<u>cost standard</u>	33%	E/O % accessible 4 cubicle block non-accessible 4 cubicle block	18.81%	<u>Standard /m2</u>	<u>Accessible /m2</u>	109%
		194%						
On average		145%	27%		9%		81%	

Inclusive Primary Education in Tanzania: the role of Accessible Sanitation

8.8 Example calculation summary for modified WEDC Cost Estimate

Equiv SMM for Building Works in East Africa (1970)		Assumed rates	WEDC (NG SWASH Cement Blocks -fully lined, boys p28/29,32,34)												Accessible														
rate	units	Standard	A - cubicles	Value	B - corridor	Value	C - urinal	Value	D - water jar slab	Value	E - privacy wall	Value	F - steps	Value	A - cubicle	Value	B - corridor	Value	E - privacy wall	Value	F - ramp	Value							
D4	Substructure Clear the site of small trees, grasses, undergrowth including grubbing up their roots	461.5m2	L 2.250 W 4.200	9.45	L 7.050 W 1.000	7.05	L 1.800 W 3.750	6.75	L 2.25 W 1.50	3.38	L 11.450 W 0.150	1.72	L 1.000 W 0.150	0.15	L 2.250 W 1.650	3.71	L 1.650 W 1.200	1.98	E1 - accessible cubicle privacy wall L 1.725 W 0.230	0.40	assume slabs 1 course high i.e. 250mm (incl joint) L 1.20 W 5.00	6.00							
D3	Excavate over site average 150mm to remove topsoil and remove from site	750.0m2		9.45	7.05	6.75	3.38	1.72	0.15						3.71	1.713.32	3.36	1,550.64	0.44	204.33	6.00	2,769.00							
D10	Excavate pit not exceeding 3m deep	3,723.7	L 2.250 H 3.000 W 4.200	28.35	L 1.800 H 0.650 W 3.825	4.48	L 11.450 H 0.900 W 0.300	3.09							L 2.250 H 3.000 W 1.650	11.14	L 6.900 H 0.650 W 0.200	0.90	E1 - accessible cubicle privacy wall L 1.725 H 0.900 W 0.300	0.47	E2 - longer privacy wall L 0.200 H 0.900 W 0.300	0.05	6.00	4,500.00					
D15	Earth backfill, compact and consolidate ext b'fill to foundation footings	3,500.0m3	L 4.500 H 2.850 W 0.150	1.92	L 9.225 H 0.500 W 0.150	0.69	L 22.900 H 0.750 W 0.150	2.58							L 5.550 H 2.850 W 0.150	2.37			E1 - accessible cubicle privacy wall L 3.450 H 0.750 W 0.150	0.39	F - ramp assume 100mm slab laid on graded 0.5 L 5.00 H 0.18 W 1.20	0.54	1,935.40	0.00	1,890.00				
D20	Hardcore backfilling b'fill under slabs above EGL assume slabs 1 course high i.e. 250mm (incl joint)	38,295.0m3		0.00	L 7.050 H 0.15 W 1.000	1.06	L 1.500 H 0.650 W 3.600	3.51									B1 - corridor (slab) L 1.650 H 0.15 W 1.200	0.30					0.00	19,300.68	0.00	0.00			
D15	Disposal of excavated materials	6,500.0m3		26.43		0.00	3.78	0.00	0.52															0.00	0.00	0.00			
D19	Planking and strutting generally	400.0m2	L 10.650 H 3.000	31.95											L 5.550 H 3.000	16.65									0.00	0.00	-0.54	-3,510.00	
F3/ F8/ F7/ F10	C15 concrete (1:3:6) footings, slabs, kerbs, steps	224,545.7m3	L 10.650 H 0.150 W 0.300	0.48	L 7.050 H 0.100 W 1.000	0.71	L 9.000 H 0.150 W 0.300	0.41	L 2.25 H 0.10 W 1.50	0.34	L 8.050 H 0.150 W 0.300	0.36	L 1.000 H 0.050 W 0.300	0.30	L 5.550 H 0.150 W 0.300	0.25	L 1.650 H 0.100 W 1.200	0.20	E1 - privacy wall (strip footing) L 1.725 H 0.150 W 0.300	0.08	F - ramp 1 L 5.00 H 0.10 W 1.20	0.60	0.00	6,660.00	0.00	0.00			
F7/ F10	C20 concrete (1:2:4) beams, slabs have ignored box outs for drop holes	218,652.1m3	L 2.250 H 0.250 W 0.150	0.17	L 2.250 H 0.100 W 4.200	0.95	L 2.250 H 0.100 W 4.200	0.95							L 2.250 H 0.100 W 1.650	0.37			E2 - longer privacy wall (strip footing) L 0.200 H 0.150 W 0.300	0.06			0.14	30,903.10	0.60	134,727.40			
G53	75x300mm lintel/ cill	8,037.0m	L 1.300 H 0.075 W 0.300	0.09											L 1.300 H 0.075 W 0.300	0.03								0.00	0.00	0.00	0.00		
F16	supply and fix T8 reinforcement 40mm cover	2,206.9kg	L 3.840 kg/m 0.395	3.03											L 3.840 kg/m 0.395	1.52									0.00	0.00	0.00	0.00	
F16	supply and fix T10 reinforcement	2,400.0kg																							0.00	0.00	0.00	0.00	
F16	supply and fix T12 reinforcement	1,766.2kg	L 8.680 kg/m 0.888	15.42	L 8.680 kg/m 0.888	15.42	L 8.680 kg/m 0.888	15.42							L 8.680 kg/m 0.888	7.71									0.00	0.00	0.00	0.00	
F16	supply and fix T16 reinforcement	2,228.0kg	L 3.340 kg/m 0.888	8.90											L 3.340 kg/m 0.888	5.93									0.00	0.00	0.00	0.00	
F17	supply and fix A142 mesh	6,884.5m2	L 4.200 W 0.450	1.89	L 6.900 W 1.000	6.90	L 1.500 W 3.600	5.40							L 1.650 W 0.450	0.74	L 1.650 W 1.200	1.98	B2 - wider corridor (slab) L 6.900 W 0.200	1.38				0.00	5,111.74	3.36	23,131.92	0.00	0.00
F20	Hori formwork: suspended soffit	36,553.5m2	L 1.800 W 4.200	7.56											L 1.800 W 1.650	2.97									0.00	0.00	0.00	0.00	

8.9. MoEVT research permit

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION AND VOCATIONAL TRAINING

Cable: "ELIMU" DAR ES SALAAM
Telex: 41742 Elimu Tz.
Telephone: 2121287, 2110146
Fax: 2127763



Post Office Box 9121
DAR ES SALAAM

In reply please quote:
Ref. ED/EP/ERC/VOL IV/35

Date: Friday June 3, 2011

The Regional Administrative Secretary;
Dar es Salaam and Dodoma

(ATT. Regional Education Officer):

RE: RESEARCH CLEARANCE FOR M/S. WATERAID.

The captioned matter above refers.

The WaterAid has been working in close with the Ministry of Education and Vocational Training (MoEVT) to improve school water and sanitation. WaterAid in partnership with CCBRT and MoEVT are carrying out research titled "*Understanding the role of Sanitation in Achieving Inclusive Primary Education in Tanzania*".

The research team is accompanied by MoEVT official and needs to collect data and necessary information related to the research topic from the sampled Primary schools.

In line with the above information you are being requested to provide the needed assistance that will enable them to complete this study.

The period by which this permission has been granted is from **3rd June to 30th July 2011**.

By copy of this letter, **M/S. WaterAid** is required to submit a copy of the report (or part of it) to *the Permanent Secretary, Ministry of Education and Vocational Training* for documentation and reference.

Yours truly,

A handwritten signature in black ink, appearing to read 'A. Ngödu'.

Abdallah S. Ngödu

For Permanent Secretary

CC: M/S. Water Aid, P.O.Box 33759, Dar es Salaam