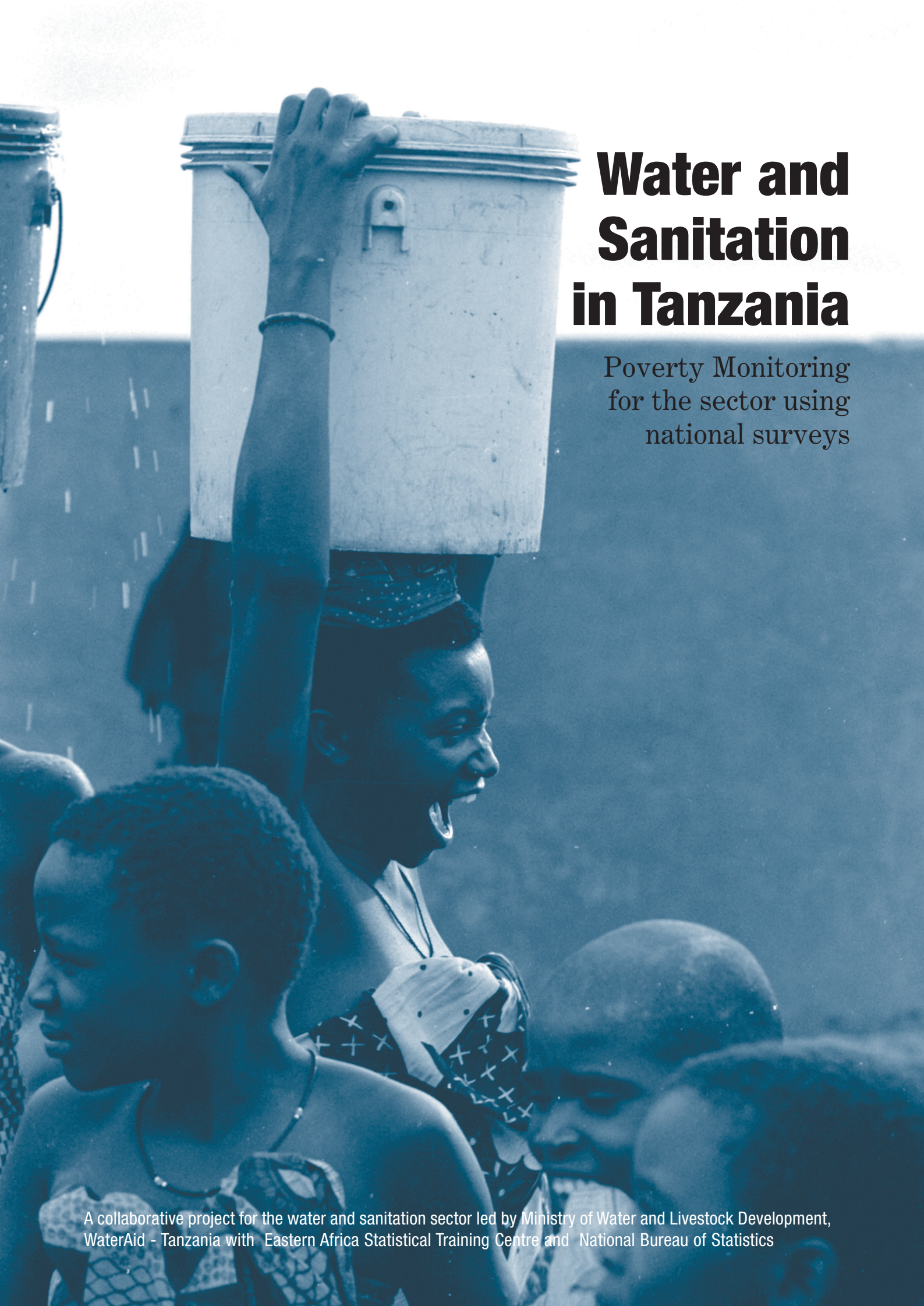


Water and Sanitation in Tanzania

Poverty Monitoring for the sector using national surveys

A collaborative project for the water and sanitation sector led by Ministry of Water and Livestock Development, WaterAid - Tanzania with Eastern Africa Statistical Training Centre and National Bureau of Statistics

Foreword

Bakari A. Mahiza
Permanent Secretary
Ministry of Water and Livestock Development

Tanzania's Poverty Reduction Strategy Paper (PRSP) recognizes, eliminating poverty will not be done without providing every person with access to safe drinking water.

In 2001 Tanzania developed a Poverty Monitoring System to coordinate the gathering of evidence on the welfare of poor people. Sources for this evidence include national surveys, the census, routine data collected by ministries and local government as well as specific pieces of research and analysis.

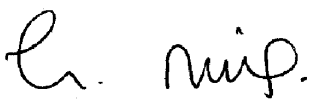
Over the past year the Ministry of Water and Livestock Development has been working with WaterAid, the Eastern Africa Statistical Training Center and the National Bureau of Statistics on this study looking at poverty monitoring in the water and sanitation sector.

The study, supported by the Department for International Development (DFID), evolved out of a water and sanitation stakeholders' workshop, held in September 2001, which reviewed the indicators and highlighted gaps in both the list of indicators and in the data collection systems designed to measure the indicators. The poverty monitoring study that emerged was guided by an Advisory Team with representation from MoWLD, MoH, UNICEF, UCLAS, NETWAS, NBS, ESTAC, REPOA and Concern Worldwide.

The study evaluates water and sanitation indicators used by routine and survey data collections systems in Tanzania and examines the way in which data on water and sanitation is recorded and collated. It also reports on trends derived from existing indicators and from those trends reflects on the utility of indicators used. Finally the report recommends changes to indicators for both routine data collection and national surveys.

The findings were shared at the technical level at a workshop held at the Planning Commission on the 22nd of May 2002. The presentation was shared and discussed by staff from PO-PP, VPO, MoWLD Directors, the National Bureau of statistics, the Local Government Reform Programme, ESRF, REPOA, Bank of Tanzania, DFID, JICA, UNDP, Netherlands International Cooperation (DGIS), Concern Worldwide and WATSANET.

Continued collaboration will be key to ensuring that the necessary modifications are consolidated in the relevant national surveys and that the quality and consistency of water and sanitation data is improved. In turn this will be a significant step towards strengthening Tanzania's poverty monitoring system and our efforts to eradicate poverty.



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Acknowledgements

This study was a collaborative project for the water and sanitation sector led by the Ministry of Water and Livestock Development, WaterAid - Tanzania with Eastern Africa Statistical Training Centre and National Bureau of Statistics.

This report was written by Jenni Marshall, WaterAid-Tanzania with Dr Zakyao Msokwa EASTC and Mr Felix Ngamlagosi, MoWLD. Mrs Naomi Lupimo of MoWLD contributed significantly to earlier stages of the work. Mr Said Aboud and the HBS team from the National Bureau of Statistics also assisted. The analysis was carried out with input from Advisory Team (as above plus Mrs Mary Swai, Ministry of Health; Mrs Rebecca Budimu, UNICEF; Eng Richard Evans, Concern Worldwide; Professor Kironde, UCLAS, with input from NETWAS and WATSANET). The study also benefited from conceptual support from Alana Albee, Senior Social Development Adviser DFIDEA(T) and the Research and Analysis Working Group of the Poverty Monitoring System.

Contents

Executive Summary

Tanzania's Poverty Reduction Strategy Paper (PRSP) recognizes that the eradication of poverty will not be achieved without providing every person with access to safe drinking water.

In 2001 Tanzania developed a Poverty Monitoring System to coordinate the gathering of evidence on the welfare of poor people, including their access to safe water and sanitation. Sources for this evidence include national surveys, the census, routine data collected by ministries and local government as well as specific pieces of research and analysis.

This study reviews water and sanitation indicators used by national surveys in Tanzania. It examines the way in which data on water and sanitation is recorded and collated. The study reports on trends derived from existing indicators and from those trends reflects on the usefulness of existing indicators. Finally the report recommends changes to indicators for use with national surveys.

"The study reports on trends derived from existing indicators and from those trends reflects on the usefulness of existing indicators. "

Comparing surveys for analysis

Analysis of water and sanitation data collected by national surveys was carried out using the Household Budget Survey (HBS), the Demographic and Health Survey (DHS) and the Population and Housing Census. Each of these studies gives national figures and can be disaggregated by rural and urban areas. The HBS 2001 sample allows greater disaggregation, including disaggregation at regional level.

Wording of the indicators for water and sanitation makes comparison across all three surveys limited. However, where the wording of questions was sufficiently clear and consistent - such as for 'percentage of households using piped water' - this study demonstrates that the results of the three surveys can be compared.

Measuring Safe Water and Effective Sanitation

The definition of safe water used in the PRSP indicator 'Proportion of households with access to safe drinking water (in rural and urban areas)' is not directly measured by any of the surveys. Some surveys do however measure use of improved sources, which is a commonly accepted proxy for safe water sources. In addition to piped water, improved sources include wells or springs that have been protected by enclosing the source to prevent contamination by run-off water. Use of improved sources has been recorded by the HBS since 1991 and by the DHS since 1999.

Sanitation data is not comparable across the three surveys. The DHS records ownership while the HBS records use of toilet facilities. Both surveys record questionably high percentages, above 90% for most regions. In addition the response options for toilet facilities are confusing - the term VIP (ventilated improved pit) being too specific and the term 'pit latrine' being too broad. Notably there are no survey data on sewage systems.

Trends in use of water sources

Long-term trends for drinking water sources were analysed for piped water, well water and surface water. As sources of well water include both protected (improved) and unprotected wells it is not possible to assess long-term trends of access to safe water.

Trends over the period 1978 to 2000 do not reveal significant changes in the percentage of households served by piped or well water. However, the population has grown from 17 million in 1978 to around 32 million in 2000 so the absolute number of households served has nearly doubled.

Rural-urban disparity throughout the period is very large. Households using piped supplies in urban areas being around 80% compared to rural areas with piped supplies in the 20-25% range for the same period.

In rural areas the percentage of households using surface water (dams, lakes, ponds, rivers and streams) has dropped from just under 30% in 1991 to around 17% in 2000. This is positive as surface water sources are associated with higher health risks than other sources.

For a more detailed analysis of the proportion of households with access to safe water this study focused on the 1991 and 2000 Household Budget Surveys. In line with the definitions used for the Millennium Development Goals this study analyses improved sources as a proxy for safe sources. The analysis for 'use of improved water sources' was broken down into three parts; rural areas, Dar es Salaam and urban centers other than Dar es Salaam.

In rural areas the proportion of households using improved sources (piped and protected) rose by 11%. This is contributed to by a combined rise in the use of piped sources (up 3%) and protected wells and springs (up 8%).

In Dar es Salaam the proportion of households using piped water dropped by just over 7%. This drop in use of piped water has been compensated for by a shift to protected sources (up 4%) as well as small shifts to unprotected sources (up 2%), tankers and vendors.

There was little change in urban areas other than Dar es Salaam with only a small rise in the proportion households using improved sources (up 4%).

Trends in access

Distance and time to water source give a partial indication of the burden of domestic water management felt by women and children in Tanzania and is an indication of time that could be spent on more productive and social activities.

Surveys are not consistent in their measurement of time and distance to water and none of them measure the National Water Policy target of 'within 400 meters'. This study, however, recommends 'time to fetch water' as a more useful indicator than 'distance to water source'.

The indicator 'time to fetch water' includes going to the water source, waiting, collecting water and returning home. The Demographic and Health Survey, illustrates the change in 'time to fetch water' over the 1990s. In urban areas there has been a 14% drop in the proportion of urban households taking less than 30 minutes to fetch water. This is particularly significant given that the HBS reported that the 'proportion of urban households with access to water within less than one kilometer' actually rose by 3%. So 'time to fetch water' is a better indicator of the changing demand or stress that managing water puts on, particularly, women.

"Surveys are not consistent in their measurement of time and distance to water and none of them measure the National Water Policy target of 'within 400 meters'."

Regional variation in use of improved water sources

Regional differences in the use of water sources can be compared using the HBS data sets. There is a clear pattern between the 'proportions of households with improved water sources' and Government/donor funded water supply programmes. Though this is revealing, intra-regional differences are hidden as HBS data can only be disaggregated to the regional level. As districts are the principal agencies for implementing development activities, surveys would ideally collect sufficient data to enable analysis by district. Though the cost of doing this for national surveys may be prohibitively expensive the refinements to 2002 Census water indicators should enable analysis of protected and unprotected sources by district.

The HBS also records high regional disparities in household water use from protected sources in rural areas, Lindi 11% as compared to Kilimanjaro 74%. These figures differ considerably from the Ministry of Water and Livestock Development's routine data figures for the same year (Lindi 34% and Kilimanjaro 48%). Two factors may contribute to this. First, that routine data is collected on the basis of population coverage rather than households. Second, that the HBS data is based on samples whereas routine data is collated from region wide administrative sources. These differences emphasise the need to make sources clear when quoting national statistics.

Gender and water

Female headed households - as recorded by the HBS - were 7% more likely to be using piped water than male headed households. Surface water use by female

headed households was also 5% lower than that for male headed households. This suggests that women headed households tend to choose protected water sources and/or prioritise water within the household budget. This an area for further research.

"The fact that this analysis relies so heavily on the data collected by the HBS is evidence that data quality and consistency across national surveys needs to be improved."

Education and water

School aged children living within 15 minutes of their drinking water source were 12% more likely to be attending school than children living over one hour from their source of drinking water.

Poverty and water

The basic needs poverty line (derived from expenditure data), developed by the National Bureau of Statistics, is used by this study to look at differential access for households above and below the poverty line in the year 2000.

Though poverty was greater in rural areas, inequality was greater in urban areas. In rural areas 51% of households above the poverty line were using unprotected sources compared to 57% of households below the poverty line; a relatively small difference. In contrast, though only 12% of urban households were using unprotected sources, those households were twice as likely to be below the poverty line. In Dar es Salaam this inequality is even greater. Though only 7% of households were recorded as using unprotected sources these households were six times more likely to be those below the poverty line.

Summary of recommendations

The HBS recorded that 46% of rural households in the year 2000 were using water from improved sources (up 11% from 1991). In urban areas the survey records that 88% of households were using water from improved sources. However, in Dar es Salaam access to improved water sources had dropped by 3% since 1991. In addition the DHS recorded that urban households able to fetch water in under 30 minutes has dropped by 14% to 64% over the same period.

The fact that this analysis relies so heavily on the data collected by the HBS is evidence that data quality and consistency across national surveys needs to be improved. In order to improve consistency and comparability this study recommends a number of modifications to national surveys data collection. Of these, the five key recommendations are:

1. differentiate between protected and unprotected water sources so that access to improved water sources can be measured.
2. adopt the indicator 'time taken to fetch water'
3. rethink questions to capture the reality of the sanitation situation in Tanzania e.g. ownership does not necessarily mean use of toilet facilities
4. ensure that improved water and sanitation data is collected by the census and is analysed at the level of district
5. ensure comparable formats of questions on water and sanitation issues across surveys and censuses

Acronyms

CWIQ	Core Welfare Indicator Questionnaires
DANIDA	Danish International Development Agency
DAWASA	Dar es Salaam Water and Sewerage Authority
DFID	Department for International Development
DHS	Demographic and Health Survey
DPP-MoWLD	Directorate of Policy and Planning - Ministry of Water and Livestock Development
Eas	Enumeration Areas
EASTC	Eastern Africa Statistical Training Centre
ESRF	Economic and Social Research Foundation
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit
HBS	Household Budget Survey
HIPC	Highly Indebted Poor Country
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt fur Wiederaufbau
LGRP	Local Government Reform Programme
MoH	Ministry of Health
MoWLD	Ministry of Water and Livestock Development
NBS	National Bureau of Statistics
O&M	Operation and Maintenance
OPML	Oxford Policy Management Limited
PMS	Poverty Monitoring System
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
PWMI	Poverty and Welfare Monitoring Indicators
REPOA	Research on Poverty Alleviation
RWSD	Rural Water Supply Database
TAS	Tanzania Assistance Strategy
TCRS	Tanzania Christian Refugee Services
TSED	Tanzania Socioeconomic Database
UCLAS	University College of Lands, Architectural Sciences
UNDP	United Nations Development Programme
UNICEF	United Nations Childrens Fund
URoT	United Republic of Tanzania
VIP	Ventilated, Improved Pit
WA	WaterAid
WAMMA	Wafadhili Maji, Maendeleo ya Jamii na Afya

Introduction to poverty monitoring for water and sanitation

1.0

1.1 Water, Sanitation and Poverty in Tanzania

All of those involved in the water and sanitation sector know from experience that improvements in access to clean and safe water supplies and good sanitation have extensive and multi-dimensional impacts on people's lives. As impact studies have shown, better access to water and sanitation leads to improvements in, for example: girls, boys, women and men's health and hygiene; rural and urban livelihoods; children's attendance at school; people's, especially women's, psychological wellbeing and social interaction (WaterAid, 2000; Narayan, 1997; MoWLD, 2002).

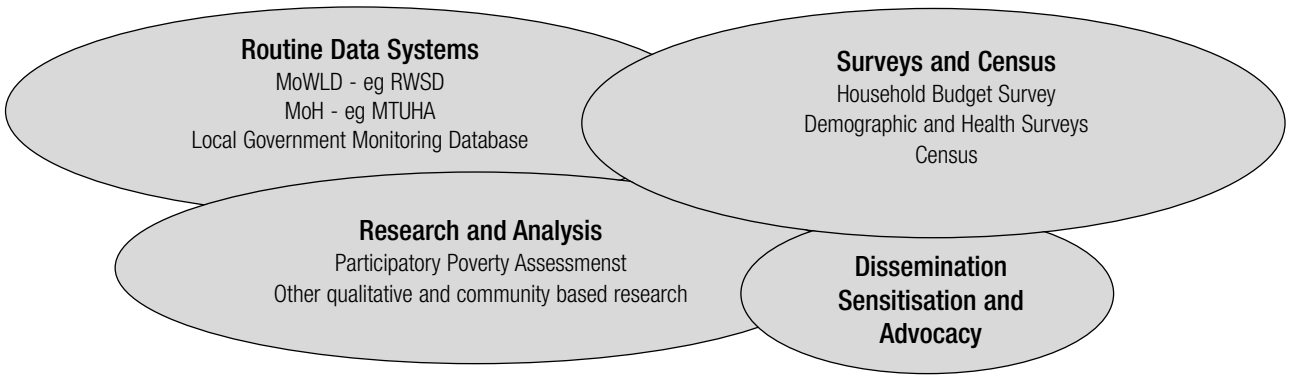
As Tanzania's Poverty Reduction Strategy Paper (PRSP) recognises, we cannot achieve the goals of poverty reduction and ultimately poverty elimination without providing every person with access to safe drinking water (URoT, 2000). This access should be sustainable and to an improved source, that is reliable all year round (adapted from the Millennium Development Goals signed up to by Tanzania in 2000). To meet the aim of universal access, the water sector has been identified as a priority sector for the poverty reduction strategies and budgets. The Poverty Monitoring System monitors whether such aims are being reached.

1.2 Water and Sanitation in Tanzania: Monitoring for informed poverty eradication strategies

The Poverty Monitoring System (PMS) was developed in 2001 to "ensure the availability of timely and reliable evidence on poverty" in Tanzania (URoT, 2001b). This evidence is required to determine whether activities implemented under the National Poverty Eradication Strategy (URoT, 1997), Tanzania Assistance Strategy (TAS) (draft, 2001) and PRSP (URoT, 2000, URoT 2001a) are really improving the welfare of poor people in the country.

The system advances a co-ordinated national-level approach to data and information collection, analysis and communication that focuses on the four areas shown in figure 1.2.1 below. Water and sanitation data and information is therefore collected by surveys and census, through routine or administrative systems and through commissioned pieces of research/analysis (see Tsikata and Mbilinyi, 2001 for overview of priorities for research). Improvements to the water and sanitation routine data systems (see appendix 1.2.1 for a diagram of information flow) are, however, still being developed. Partly for this reason, and because surveys are an important data collection method, we focus on information gained from surveys and census.

Figure 1.2.1. Water and Sanitation data and information collection, analysis and dissemination through the PMS



BOX 1.3.1 Indicators for informing the Poverty Reduction/Eradication Strategies

Poverty Reduction Strategy Paper
- Population with access to safe water (for rural and urban)

Poverty and Welfare Monitoring Indicators
- Percentage of households with access to adequate amount of safe drinking water within 400m
- Percentage of households with access to adequate supplies of water within 400m
- Percentage of households with (i) toilet facility (ii) access to toilet facility
- Percentage of urban households with access to garbage disposal facilities
- Percentage of urban households with (i)access to sewage systems (ii) cesspool emptying (iii) access to (waste) disposal facility (suggested)
- Percentage of population contributing to water services

1.3 Water and Sanitation in Tanzania: Poverty Monitoring Indicators

The Vice President's Office Poverty and Welfare Monitoring Indicators (URoT 1999) were developed to monitor the National Poverty Eradication Strategy. The PRSP has one water indicator in its list of core indicators for the sector (URoT, 2000, URoT 2001a). See box 1.3.1. Other monitoring systems and strategies contain variations of these main indicators.

A water and sanitation stakeholders' workshop was held in September 2001 reviewed the indicators and highlighted gaps in both the list of indicators and in the data collection systems designed to measure the indicators. Appendix 1.3.1 details the findings. The plans for this study of national surveys evolved from the September meeting.

1.4 Water and Sanitation in Tanzania: the study objectives

This study was designed to inform Tanzania's Poverty Reduction Strategy. It explores the changes in people's access to water and sanitation in mainland Tanzania and relationships between water and poverty. Due to access and then technical problems with some of the data, the depth of the analysis is limited in some aspects.

The study brought together key national level stakeholders working in the water and sanitation sector including ones with strong links to District and community based stakeholders. The collaborative work was led by the **Department of Policy and Planning from the Ministry of Water and Livestock Development (MoWLD)** and **WaterAid-Tanzania** with a statistician contracted from EASTC. Other partners in the work included:

Government and UN	**Research organisations/ agencies**
• MoWLD (Departments of Rural Water Supply and Water Resources) • Ministry of Health (Department of Preventative Services) • UNICEF, UNDP, DFID	• Eastern Africa Statistical Training Centre (EASTC) • National Bureau of Statistics (NBS) • UCLAS • REPOA
NGOs with water and sanitation focus/programmes	**Other poverty monitoring actors**
• Concern Worldwide • WATSANET • NETWAS	• Local Government Reform Programme • TSED

Data sources and their comparability 2.0

2.1 National household surveys used

See appendix 2.1.1 for details of the surveys and their relevant variables.

2.1.1 Household Budget Survey 1991 and 2000/1

The Household Budget Surveys (HBS) collect data on key socio-economic characteristics of household members, household living conditions, household economic activity, income and expenditure. The HBS has been carried out in 1969, 1976/7, 1991 and 2000/1. It is planned for 2006 and 2011 (URoT 2001b). This study only used the 1991 and 2000/1 surveys for the following reasons:

- The raw data was only available in a readable format for 1991 and 2000/1 surveys (see NBS and OPML, 2000 for details);
- Complete sets of reports and questionnaires could not be located for either the 1969 and 1976/7 surveys that detailed the methodology and sample weighting used;
- The questions and response options for water and sanitation used in the older surveys are not comparable with the later surveys.

Raw data sets for both the 1991 and 2000/1 surveys were obtained from the National Bureau of Statistics. Both data sets used were those re-cleaned and re-weighted for the poverty analysis in 2002, rectifying oversampling of certain (particularly urban areas) and compensating for those areas not covered when the sample size was reduced mid-way through the HBS 2000.

For water and sanitation, the key variables for the study are:

- Main drinking water supply for household
- Toilet facilities used by household
- Garbage disposal methods used by household
- Distance (and time for 2000/1) to drinking water source in the dry season
- Expenditure on water

2.1.2 Demographic and Health Surveys in the 1990s

The Demographic and Health Surveys (DHS) collect data on key health issues such as family planning, infant and child mortality, maternal and child health and nutrition and HIV/AIDS in Tanzania (including Zanzibar). The surveys were carried out in 1992, 1994, 1996 and 1999 and are planned for 2004 and 2009 (URoT 2001b). This study uses information from the household surveys from all four surveys carried out in the 1990s and data from the women's survey for the DHS 1996. Raw data sets for all surveys were obtained from Macro International (www.measuredhs.com) although the National Bureau of Statistics also hold them. All of the data sets used were weighted using the appropriate weights contained in the surveys to rectify over-sampling of certain areas, as directed by Macro International.

Zanzibar figures have been removed for 1996 and 1999; the 1994 survey was mainland only and 1992 the regions are classified in zones making it impossible to remove the islands. It should be noted that the effect of including Zanzibar in the sample for 1992 is likely to be small; in 1996 the percentage of households using piped water in the sample including Zanzibar was 0.8% higher than the sample not including Zanzibar.

For water and sanitation, the key variables for the study are:

- Main drinking water supply for members of the household
- Toilet facilities the household has
- Time taken to go to main drinking water source, to collect water and return
- Incidence of diarrhoea for infants (past 2 weeks)

2.1.3 Population Census 1978 and 1988

The Population Census (Census) collects basic demographic data for all people in Tanzania and more detailed population data plus information on housing conditions for a sample (about 1/4 of households). The census information used in the study is from those carried out in 1978 and 1988. The Population and Housing Census 2002 is currently underway and the next is planned for 2012 (URoT 2001b). Only reports were used for the Census information although the vast data sets are accessible through the NBS. The reports were sufficient for a rural and urban trend analysis and the questions used prevented any useful more detailed analysis. For water and sanitation, the key variables are:

- drinking water source used and
- toilet facilities owned

2.1.4 Surveys referenced but not included in the analysis

The Labour Force Survey (eg 2000/1) does not, in its current state, give information on water and sanitation. The Agricultural Surveys were not included. CWIQ (Core Welfare Indicator Questionnaires) were referred to for indicator development but no data was included in the analysis as the survey's methods are not comparable and they are not national level surveys. Other surveys carried out by research institutions were also not included for a range of reasons, primarily because the comparability of the main national surveys carried out by the NBS provided enough challenges!

2.2 Comparability and consistency of surveys

2.2.1 Comparing sample designs

Refer to table 2.2.1 over the page, summarised below to compare the surveys used:

- **Coverage and estimates possible.** The study must be mainland only in order for all surveys to be included (remembering DHS 1992 has to include Zanzibar). There is a huge range in survey sample size but all surveys give national (mainland) and rural/urban estimates. Only the HBS allows Dar to be analysed separately.
- **Sample designs and weights.** *Sample designs* are different for the different surveys. The DHS are based on Census enumeration areas. The HBS are based on the National Master Sample originally based on agro-economic zones and created in 1988. The DHS and HBS are both *weighted* (though using different weighting systems) to rectify over-sampling of urban areas and some regions. The weighting and re-weighting of data has a significant effect on the figures. For example, percentage of households using piped water in 1991 as recorded by the HBS is reported to be:
  - 57.4% in the HBS 1991/2 report data tables (URoT, 1994b) (known to be un-weighted valid percentages although the report does not specify this)
  - 40.1% in baseline development work (NBS and OPML, 2000) (with original weighting which did not sufficiently allow for rural-urban proportions of the population)
  - 35.9% (re-weighted valid percentages used for HBS 2000/1 analysis and used for this study)

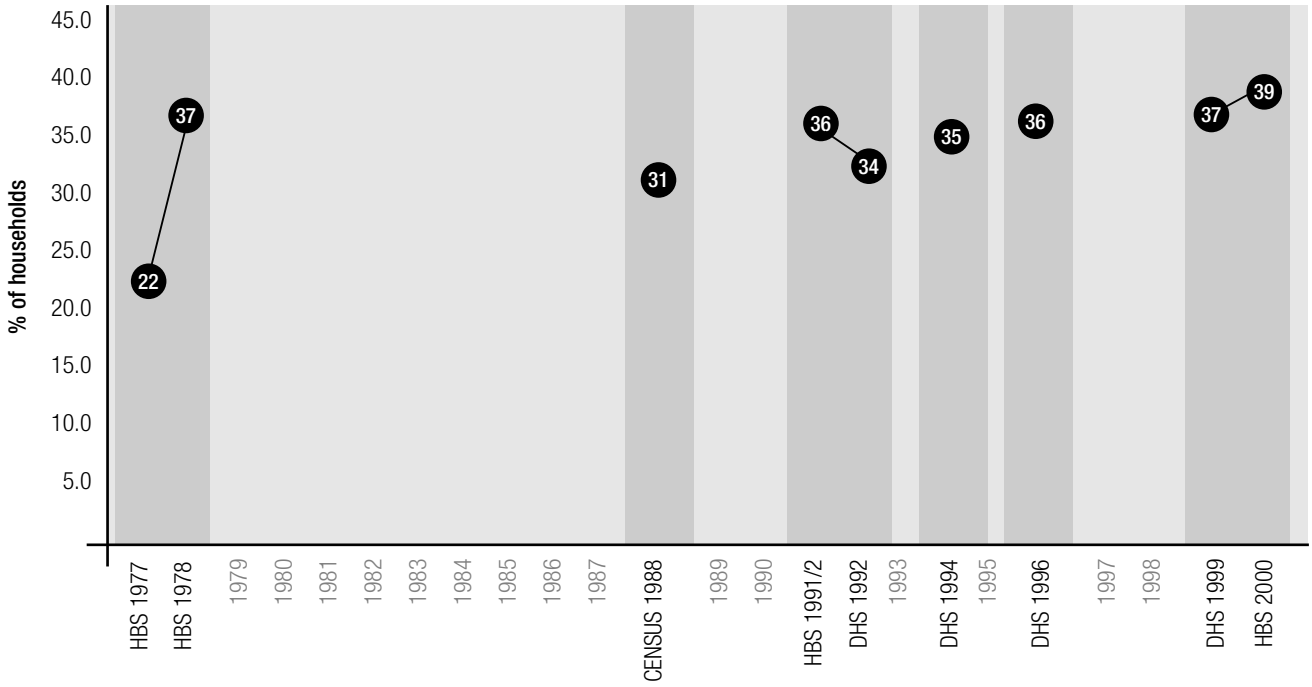
- **Errors**. *Sampling errors* are estimated to be low although water and sanitation variables are not included in the estimation of sampling errors carried out for the surveys (see United Republic of Tanzania, 1993; Bureau of Statistics and Macro International, 1997; National Bureau of Statistics and Macro International Inc., 2000; NBS and OPML, 2000). In all surveys, households in *rural enumeration areas* or survey clusters have retained their rural status (rather than gaining peri-urban or urban status) despite the expansion of urban areas into the countryside. This type of sample error is by nature more evident in the more recent surveys than those close to the 1988 Census. Similar *non-sampling errors* (for example, failure to locate and interview the correct household, misunderstandings of the questions - by the interviewer or respondent - and data entry errors) are likely for all surveys, are impossible to avoid and difficult to evaluate statistically (Bureau of Statistics and Macro International, 1997).

TABLE 2.2.1. Comparing survey sample size and design

SURVEY	SAMPLE SIZE (households)	COVERAGE AND DISAGGREGATION POSSIBLE	SAMPLE DESIGN
Census 1978	3,555,000	National (mainland and Zanzibar) Total/rural/urban	2 stage sampling: 1) Enumeration Areas systematically randomly sampled in each region. 2) Eas divided into clusters on basis of number of households & population (max 600 pple)
Census 1988	4,420,000	National (mainland and Zanzibar) Total/rural/urban Regional	Single stage sampling Pre survey enumeration- mapping households to give EAs . Those surveyed selected based on systematic equal probability sampling
HBS 1991/2	4924 re-cleaned March 2002. 4,290,332 re-weighted Mar 02	Mainland only Total/rural/Dar/other urban Disaggregation by demographic and poverty related variables possible	National Master Sample of 222 E A s (100 rural, 122 urban)
HBS 2000/1	22,189 re-cleaned Mar 02, 6,453,755 re-weighted Mar 02	Mainland only Total/rural/Dar/other urban Regional (average 1109 hhlds each) Disaggregation by demographic and poverty related variables possible	Based on National Master Sample but budget cuts reduced number of households sampled, esp rural (7627 rural, 14551 urban)
DHS 1991/2	8327 hhlds (weighted)	National (Mainland and Zanzibar) Urban/rural	Census enumeration areas
DHS 1994	4023 hhlds (weighted)	Mainland only	Census 88 enumeration areas
DHS 1996	7740 hhlds (weighted) 8120 women (15-49)	National (mainland and Zanzibar) Rural, urban (for hhlds/women/men)	Census 88 enumeration areas
DHS 1999	3615 hhlds (weighted)	National (mainland and Zanzibar) Total/rural/urban	Census 88 enumeration areas

NOTE: *Sampling Error was not calculated using water and sanitation variables in any of the surveys. Standard Error is not possible to estimate for the survey data used, preventing any plotting of confidence intervals for data points.*

FIGURE 2.2.2. Percentage of Households using piped water as their main drinking source over time



2.2.2 Consistency of data sets collected through surveys

The graph in Figure 2.2.2 above takes households using piped water to check the comparability of surveys through the consistency of the data obtained. Use of a piped source was used as it is easier for a respondent to identify a pipe/tap source compared to identifying a well or surface source which sometimes get confused (see below). The graph highlights the different figures gained from the different surveys and, in particular, the reason for dropping the HBS 1976-7 from the study (see reasons given above for this difference). The other figures are generally consistent although the differences between the HBS 1991/2 and DHS 1991/2 and the DHS 1999 and HBS 2000/1 indicate that *only general trends should be read from the graphs; percentage changes from one survey to the next should not be quoted.*

2.2.3 Comparability of questions and response options

The table in appendix 2.2.3 relates the questions and response options of the main surveys to the main indicators for water and environmental sanitation (as in Box 1.3.1 plus others that ARE measurable). It shows the lack of comparability of surveys in terms of the questions that they ask and the response options allowed. For example:

- Different response options for types of water source used are given in each of the surveys - some focus on ownership of water points, some on protection. Some of these are likely to be confused by respondents, for example 'private' ownership - is this a tap or well owned by a household or one controlled by a private company/individual selling water?
- HBS records distance and time to drinking water source in the dry season; DHS records time to fetch water from the main drinking source
- DHS measures the ownership of toilet facilities, HBS the use of facilities

Relating the questions and response options to indicators for the sector demonstrates that:

- **Population with access to safe water (for rural and urban)** is only measured by the HBS and DHS 1999, and then only if this is taken to be use of improved water sources.
- **Percentage of households with access to water within 400m** is not measured by any survey

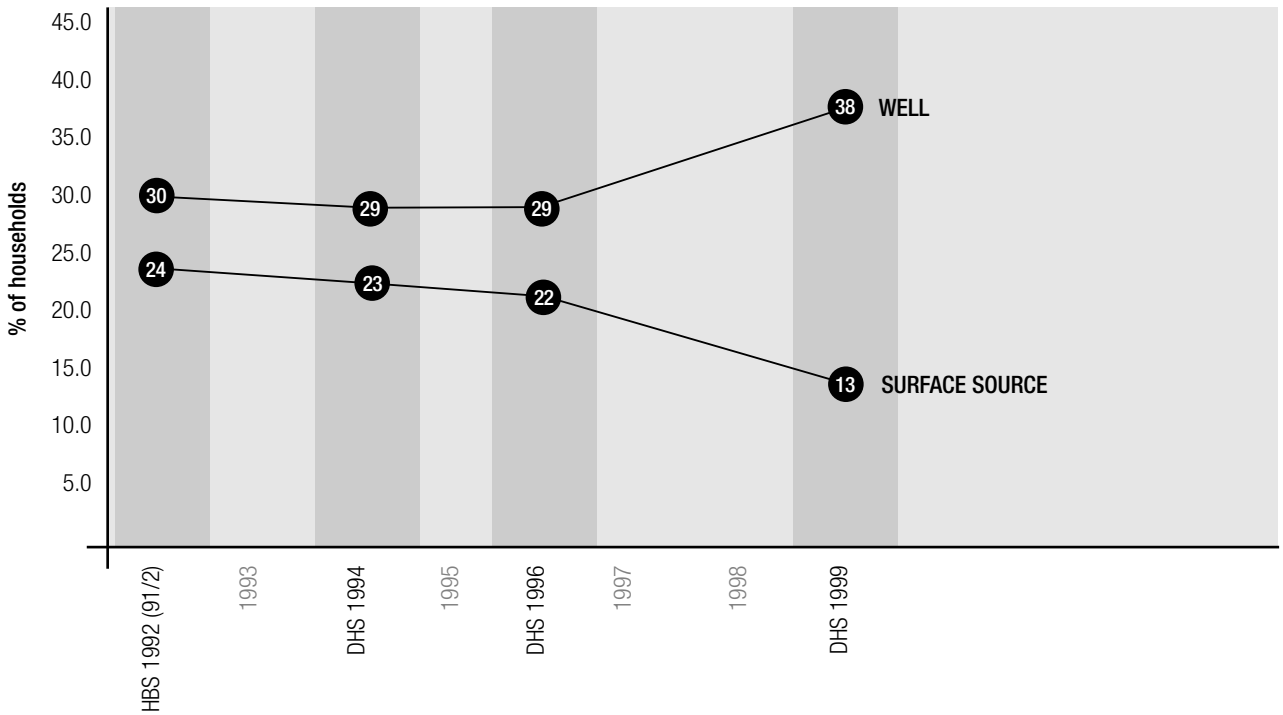
IMPLICATIONS FOR STUDY

- The only classification possible for any trend analysis using more than one type of survey is: piped water, wells, springs, rainwater, surface sources and other (unspecified or those remaining).
- Only those indicators in Box 2.2.3 can be measured and the study heavily relies on the HBS data sets as these record improved water sources.
- We need to ensure consistency with past surveys when recommending modifications for the future.

- The HBS response options for *garbage disposal facilities* do not provide useful information. No survey gives data on use of *sewerage systems*
- Misclassifications within the NBS during data entry mean that the water and hygiene expenditure data has been miscoded and these indicators are not measurable. Entries in the HBS expenditure diaries for purchases from water vendors, for example, were classified as 'bottled drinks, fruit juices and ice cream'!

Since the late 1990s, there has been a noticeable effort within the National Bureau of Statistics to make their survey questions more comparable (see DHS 1999, HBS 2000/1, forthcoming Census 2002). This is a positive move but it should be noted that changing the response options for a questionnaire can have serious implications for data consistency. The graph in Figure 2.2.3 below shows the effect of changing the response options offered to those taking part in the demographic and health surveys 1996 and 1999. In 1999 the well water options were altered to *water from open or unprotected well* AND *water from covered well or borehole* (in 1996 they were *well in residence/yard/plot* AND *public/private well*). An open, unprotected well that is dug into a river bed or perceived to be more of a hole in the ground rather than a public or private well was likely to have been classified as a surface source in 1996 but reclassified to the well category in 1999.

FIGURE 2.2.3. Change in the percentage of households using piped, well and surface sources for drinking water from 1992 to 1999 (DHS 1992-99)



BOX 2.2.3 Basic indicators possible to use in analysis

- ✔ Percentage of households using different *drinking water sources* as main source classified into: piped, wells, springs, surface sources, rainwater, unspecified others
- ✔ Percentage of households using *improved drinking water source* as main source (commonly used as measure of 'access to safe water', including piped water, protected wells and covered springs)
- ✔ Households with piped water into the home (house or plot)

- ✔ Percentage of households living *within 1km of a drinking water* supply in the dry season
- ✔ Average distance to water supply
- ✔ Percentage of households living *within x number of minutes from drinking water* supply in the dry season
- ✔ Percentage of households taking *x number of minutes to reach the source, collect water and return home*
- ✔ Average time spent fetching water

- ✔ Percentage of households using *different toilet facilities* (flush, latrines, 'other' facilities)
- ✔ Percentage of households *not using toilet facilities*
- ✔ Percentage of households *disposing of rubbish* by throwing it outside or by putting it in a pit or bin

- ✔ Household expenditure on *water* (only estimate possible due to mis-classification of water vendors)

- ✔ Percentage of members of households surveys suffering from *diarrhoea* in 4 weeks prior to survey.

2.3 Other data sources for reference

Although the study focuses on data from the main national surveys and census, some other qualitative and quantitative research and monitoring information was included:

- **Routine/administrative data generated by the Ministry of Water and Livestock Development.** Official coverage figures for population with access to water from a water scheme used by the Department of Policy and Planning were obtained from the annual budget speeches given in Parliament by the Minister (Jamhuri ya Muungana wa Tanzania, 1986, 1988, 1992, 1996, 1998, 2000, 2001; URoT, 1987). These are used to compare survey and routine figures.
- **Participatory Poverty Assessment (Narayan, 1997) and Looking Back (WaterAid, 2000).** Both participatory assessments generated information on water and sanitation and poverty in Tanzania that provided valuable insights into some of the trends.

2.4 Quantitative data analysis - points to remember

The strengths and weaknesses of survey-based approaches have been reviewed by many including Calvalho and White, 1997 (in Appleton and Booth, 2001). Surveys provide data that can be aggregated and the reliability of results can be measured. However, quantitative information should always be taken as indicative not truth-revealing. This is because:

- errors are inevitable in survey design, implementation and analysis, particularly in a country the size of Tanzania;
- surveys miss what is not easily quantifiable;
- household surveys fail to capture intra-household allocation.

The regional level disaggregation possible with the HBS also fails to capture intra-regional, intra-District, intra-ward and intra-village/street differences.

Therefore, this study aims to highlight broad trends, to reveal areas for further exploration with qualitative research and to draw recommendations for improving the way surveys capture water and sanitation data and information.

3.1 Longer-term trends in drinking water source use - for rural and urban areas

The main trend analyses that it is possible to carry out over the different surveys from 1978 to 2001 (see table 3.1) are:

- Households using piped water as the main source for drinking 1978 to 2001
- Households using well water as the main source for drinking 1978 to 2001
- Households using surface water sources as the main source for drinking 1991-2001

Households using rainwater and springs are also possible to record. However the use of rainwater as a main drinking water source is very low (0.0-0.3%). Springs will be referred to in section 3.1.2.

TABLE 3.1. Percentage of households using piped, well, rain, spring, surface and other drinking water sources 1978-2000/1

	PIPED			WELL			RAIN			SPRING			SURFACE			OTHER			TOTAL		
	RURAL	URBAN	TOTAL	RURAL	URBAN	TOTAL	RURAL	URBAN	TOTAL	RURAL	URBAN	TOTAL	RURAL	URBAN	TOTAL	RURAL	URBAN	TOTAL	RURAL	URBAN	TOTAL
Census 1978*	27.7	88.0	37.2	46.4	8.4	40.4													74	96	78
Census 1988*	18.5	79.2	31.5	60.5	17.5	51.3													79	97	83
HBS 1991	24.5	78.8	35.9	39.2	13.8	33.9	0.1	0.1	0.1	11.8	0.3	9.4	23.2	2.4	18.8	1.2	4.7	1.9	100	100	100
DHS 1991/2	19.4	78.6	33.8	35.1	13.3	29.8	0.3	0.0	0.2	11.8	1.3	9.3	29.9	4.9	23.9	3.4	1.8	3.0	100	100	100
DHS 1994	20.2	82.9	35.4	34.2	13.5	29.2	0.1	0.0	0.1	16.6	0.7	12.7	28.9	2.2	22.5	0.0	0.7	0.2	100	100	100
DHS 1996	24.7	77.5	36.4	32.9	15.4	28.9	0.2	0.0	0.1	15.4	1.9	12.4	26.9	4.5	21.9	0.0	1.1	0.2	100	100	100
DHS 1999	22.0	79.6	37.1	46.9	13.8	38.3	0.0	0.0	0.0	13.5	1.8	10.5	17.3	2.0	13.3	0.1	2.8	0.8	100	100	100
HBS 2000/1	28.4	78.9	39.3	39.7	15.6	34.5	0.2	0.2	0.2	15.3	2.0	12.4	15.8	2.1	12.8	0.7	1.2	0.8	100	100	100

* Census 1978 and 1988 gives ony 'piped', 'well' and 'other' as options
NOTE: *using valid percentages. None of the surveys show significant 'missing' data for the source variables*

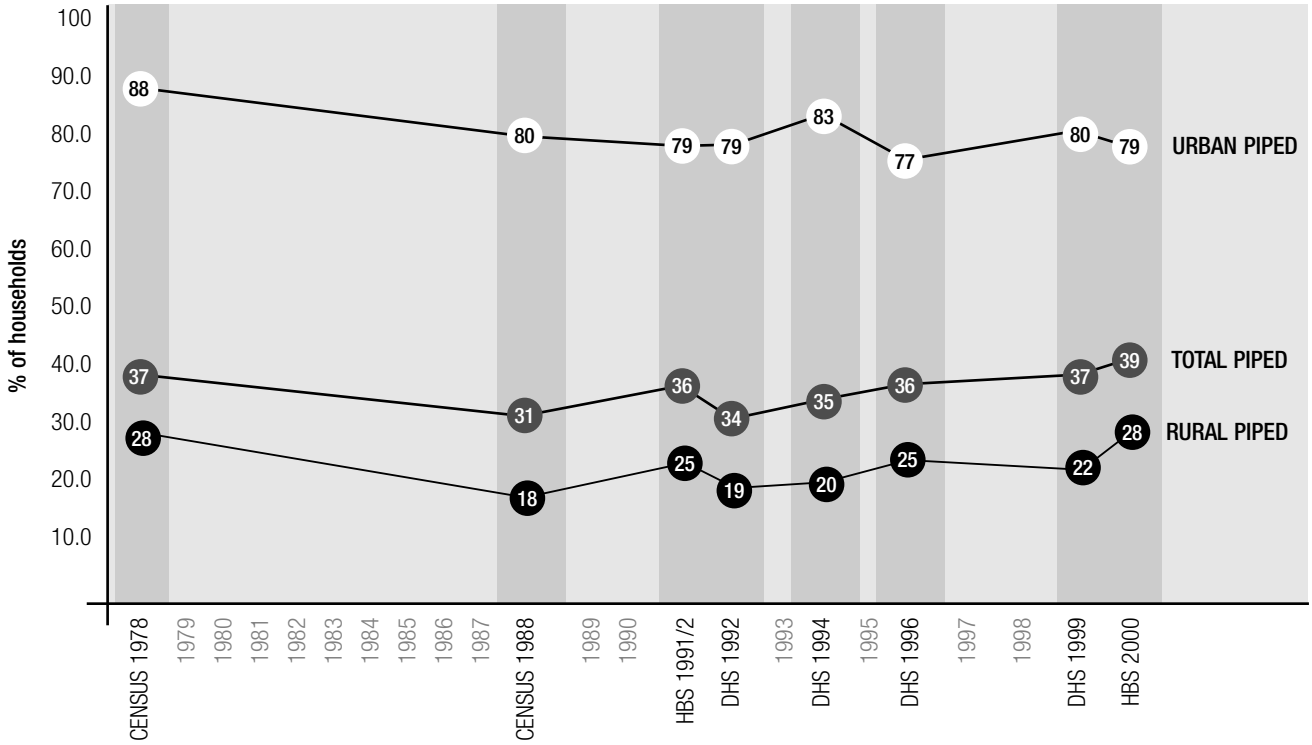
3.1.1 Use of piped water for drinking 1978 to 2001

The percentage of households using piped water supplies often gives an indication of :

- Those covered by larger scale water schemes and therefore the recipients of large scale government or development assistance investment;
- Those using an improved source which in some, particularly urban, areas is treated for improved water quality and often brought closer to people's homes for easier access;
- Those more likely to be paying for water (since the new water policy involves cost sharing) as piped schemes, especially those distributing water from deep bore holes with pump engines, have higher operation and maintenance costs.

It should be noted that piped water alone does not show the percentage of households accessing improved sources as protected wells and springs are used by many, especially rural, households.

FIGURE 3.1.1. Change in percentage of households on Tanzanian Mailand using piped water for drinking 1978-2001 by urban and rural



Refer to graph in figure 3.1.1. It shows:

- The percentage of *total households in mainland* Tanzania using piped water for drinking as their main source fell through the 1980s but has risen again slightly through the 1990s (HBS 1991 to 2000/1 shows a 3% increase). This rise through the 1990s was slight but steady - the fluctuations are as likely to be due to survey sample design as they are to be due to changes in access.
- This total households' trend mirrors that of *rural* households due to Tanzania's population being predominantly rural. The *urban trend*, however, declines through the 1980s but remains more consistent through the 1990s rather than rising.

The percentage figures for rural households do not show a different situation in 2000/1 from 1978 (both 28%) (sources: HBS 2000/1 data and Census 1978 in URoT 1994a). The percentage of urban households using piped water in 2000/1 appears to be lower than that in 1978. However, consider the *population growth* over this period. In 1978 the population of the mainland was around 17 million; in 2000 it was around 32 million (Bureau of Statistics, 1994; HBS 2000/1). This means that in real terms more people and more households used piped supply now than in 1978.

- The rural-urban disparity is vast throughout the period covered. Comparing the disparity in 1978 and 2000/s shows that perhaps the gap has reduced but in *rural areas* in 2000/1, some 28% of households used piped water and in urban areas just under 80% used piped water (source: HBS 2000/1).

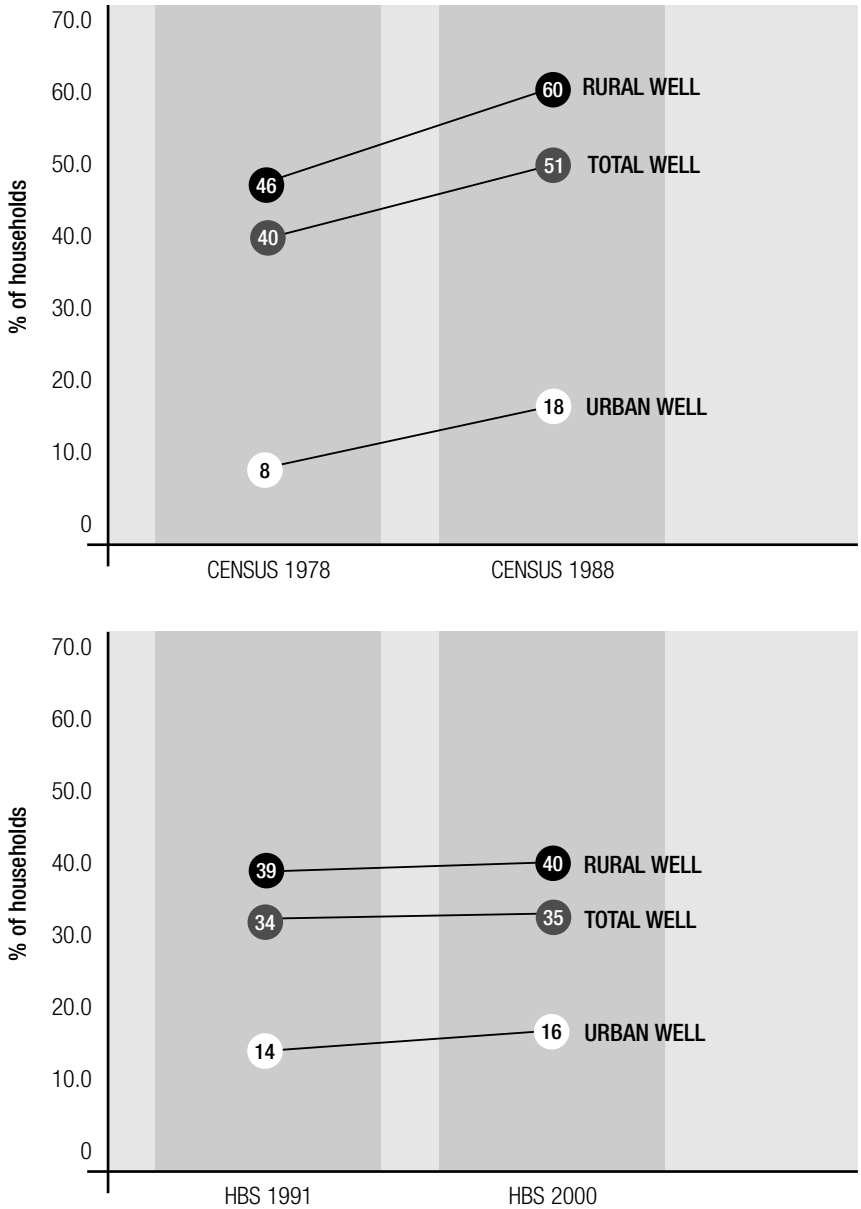
WHY THE CHANGE?

- **Technical explanation:** Many households classified as rural may well be peri-urban or urban (with higher piped use). This is because, despite using advanced weighting systems to rectify sample design biases, the urban/rural classification of enumeration areas or clusters does not allow for all expansions of urban areas.

- **Changes in investment and policy:** In the 1970s there was significant investment piped schemes that gradually ceased to function during the 1980s (URoT, 1994a; DPP-MoWLD pers comm). In the 1990s a new National Water Policy that focused on improved operation, maintenance and management of schemes was set and there has been increased investment particularly in certain geographical areas (DPP-MoWLD, pers comm; Jamhuri ya Muungana wa Tanzania 1986, 1988, 1990, 2000).

- **Increasing willingness and ability to pay:** As many piped water schemes require a payment from the household either per bucket or on a monthly/annual basis, the increased use of piped water could be the result of more households seeing the benefits (for health or their livelihood, for example) of using improved rather than unprotected water sources and being more able to contribute financially.

FIGURE 3.1.2. Change in percentage of households using wells as a drinking water source in rural and urban areas of Tanzania mainland in (a) Census 1978-1988 and (b) HBS 1991-2000/1



3.1.2 Use of well water for drinking 1978 to 2001

It is not possible to look at the longer-term trends in more detail than 'use of wells for drinking water'. The trends in the data are affected by changes in survey questions in the DHS (see section 2.2.3) and by different response options in the different surveys (the censuses ask about use of piped, wells or other whilst the other surveys are more specific about what the 'other' water sources are). For these reasons, the graphs in figures 3.1.2 (a) and (b) below show only Census and HBS trends and only the general trends should be noted as the percentages are not comparable. These graphs show:

- The use of wells for drinking water increased through 1980s in rural and urban areas. (URoT, 1994a).
- In the 1990s, there is little change evident in the percentage of households using wells for drinking water in both rural and urban areas.
- Remembering the increase in population over the period studied, many more people in Tanzania use well water for drinking in 2000/1 than in 1978.

WHY THE CHANGE IN WELL USE?

It is difficult to draw out explanations in terms of investment in groundwater development as there is no way of knowing in most of the surveys (especially Census) whether or not the sources have been improved. Households resorting to wells for drinking water as their piped water schemes broke down in the 1980s is apparent (URoT, 1994a) but there does not appear to have been a shift back in the 1990s. This could be because no satisfactory alternative is available to the households.

The percentage of households using springs for drinking fluctuates between 9.4-12.7% through the 1990s (see table 3.1) though the HBS shows a clearer increase in their use. As with wells, perceptions of whether or not the source is a spring, well or pond differ.

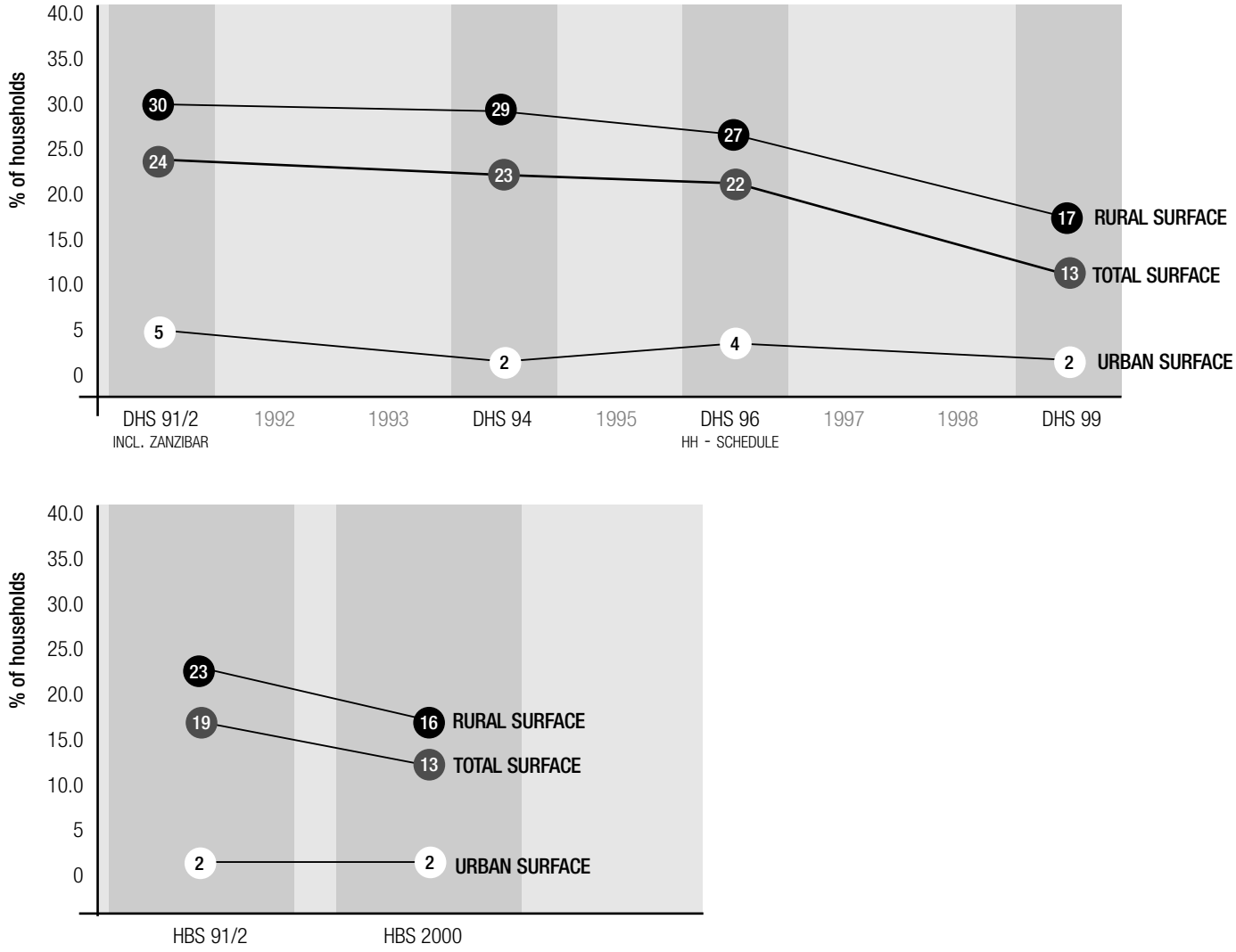
3.1.3 Use of surface water for drinking 1978 to 2001

Surface water sources (dams, lakes, ponds, rivers and streams) are generally unprotected and often deemed to be 'unsafe' for drinking, contaminated by animal, human and agricultural waste. Households using surface water sources make up a large component of those using unprotected sources (the category that also includes unprotected wells and springs, see section 3.2.1). The existence of surface water sources for use, however, depends on the area: semiarid zones are far more likely to have unprotected groundwater sources rather than surface ones.

It is unfortunate that the Census questions do not provide data for surface source use from 1978 to 1988. Figures 3.1.3 (a) and (b) above show:

- Between 1991 and 2001 there has been a reduction in the percentage of households using surface water for drinking, mainly in rural areas where more households use surface sources than in urban areas.
- This trend is evident in both the DHS and the HBS. The DHS figures are affected by question wording but the change produced data more consistent with the HBS.

FIGURE 3.1.3. Change in percentage of rural and urban households using surface sources for drinking water on Tanzania mainland 1991-2000 (a) DHS and (b) HBS.



FROM SURFACE TO PIPED SOURCES

It is from surface to piped source use that the shift appears to have occurred in the 1990s for possible reasons covered in section 3.1.1.

It is clear that a more detailed study must focus on change over the 1990s and it must be accepted that it is necessary to rely on either the HBS or the DHS (depending on the indicator being explored). It should be noted that in the future, given the move towards comparable surveys, a more interesting longer-term analysis should be able to be carried out.

3.2 Use of improved water sources as an estimation of access to safe water

3.2.1 What do we mean by access to safe water?

The indicator 'population with access to safe water' is one of the core PRSP indicators (URoT, 2001b). But what do we mean by safe? Ideally the water quality of every water source in the country would be tested and recorded by District level water and sanitation staff. The new national water policy and the planned activities in the PRSP identify water quality monitoring as a priority and databases are under construction that would store the information (eg Rural Water Supply Database). Given the issues of resources and capacity in a country the size of Tanzania, measuring quality is unlikely to be achieved on a large scale for a long time. It could also be questioned whether this is a feasible priority for budgets aimed at poverty reduction, given the commonly accepted principle that a larger quantity of water, rather than higher quality is likely to have a bigger impact for people's health (Cairncross and Feacham, 1988).

In the absence of quality data, we need to take the commonly used approach of classifying water sources into 'better' and 'worse' for drinking - at best only an estimation of relative safeness. Even then, there is no perfect classification system. Pipes could be piping water from a contaminated and untreated source. Deep boreholes and sealed shallow wells can both be polluted by nearby latrines or saline water. Some open wells and surface water sources have clean water with very low faecal coliform counts. The suitability of rainwater for drinking can depend on air pollution levels as well as method of storage. A very general classification is sufficient, as, even if the water source is protected, treated and 'safe' to drink, contamination of the water can still occur during transportation or storage in the home. The general classification system outlined in the box below was agreed upon with the Department of Policy and Planning and applied for the study (Mrs Naomi Lupimo, Mr Felix Ngamlagosi, Mr Shirima and My Nyenza, personal communication, Nov 2001-Mar 2002).

WATER SOURCES

Improved	Not Improved
PIPED • All piped water - into the housing unit or plot, into a neighbour's house, to a community standpost, to a privately-run water point.	UNPROTECTED • Unprotected wells • Uncovered springs • Surface sources - dams, ponds and lakes, rivers and streams
PROTECTED • Protected wells - boreholes/tubewells, medium/shallow wells with handpumps • Covered springs	OTHER (those not possible to classify) • Rainwater (as not recorded whether stored in sealed or open tank) • Other unspecified sources (likely to include tankers, water vendors, bottles which until recorded as a separate category cannot be classified.

Interestingly, the International Development Targets required monitoring the "proportion of people who are unable to reach or afford safe drinking water" [author's own emphasis] (DFID, 2001). When the IDTs evolved into Millenium Development Goals, the wording changed to the:

> *proportion of population with sustainable access to an improved source* [author's use of emphasis] (United Nations, 2001)

These targets also provoke thought about what is meant by access. Access involves being able to physically reach the source and being able to afford the water charges. It should be sustainable access - both financially and in terms of the reliability of the source yield. These concepts will be revisited in section 7.0's recommendations for modifying the indicators. The important point here is that the national surveys measure access largely in terms of households' USE of sources.

In order to use the main national surveys to measure the PRSP core-indicator of 'population with access to safe water' we must use an estimation of households and of population using improved water sources (piped and protected).

3.2.2 Measuring the PRSP indicator: Improved water source use in Tanzania in 2000/1

Table 3.2.2 shows the total percentage of households using improved (piped plus protected) water in 2000/1 was 55.5% (56%); 46% in rural areas and 88% in urban (source: HBS 2000/1). These are similar figures as those recorded by the DHS 1999. The total mainland percentage has increased by 10% from 46% in 1991.

TABLE 3.2.2. Measuring the PRSP indicator over time

	1991			2000/2001		
	HOUSEHOLDS %	POPULATION %	POP. ESTIMATE	HOUSEHOLDS %	POPULATION %	POP. ESTIMATE
Rural	35	-	-	46	46	11.8 milliom
Urban (not Dar)	84	-	-	88	86	3.8 million
Dar	97	-	-	94	93	1.7 million
TOTAL	**46**	**43**	**10.5 million**	**56**	**54**	**17.3 million**

Source: HBS 1991, 2000/1. Population calculations based on 1991 mainland population projected from Census 1988 figures using a growth rate of 2.8% (Bureau of Statistics, 1994) and estimates for 2000 (personal communication with OPML and NBS, 2002).

The percentages of population using improved sources do not differ greatly from the household percentages. See section 5 on household size and use of water. In 2000/1, the percentage of the population using improved sources for drinking in rural areas was 46% and in urban areas, 86%. This suggests that it cannot be said with confidence that many more larger households use unimproved sources than small - though in urban areas there is a slight suggestion in the figures that this is the case.

Note that the population figures for Dar es Salaam vastly underestimate the total population. The HBS suggests a total of around 1.9 million for Dar. Other sources quote 3 million as the population (eg Dar City Commission, 1999).

These figures should be compared with the Ministry's (incomplete) set of figures announced in the budget speeches (see Appendix 3.2.2). In 2000 it was reported that 50% of the rural population has access to clean water. In 1992, the rural figures was 43%. In urban areas the figure in 2000 was estimated to be 68% rising to 70% by 2001 (Jamhuri ya Muungana wa Tanzania, 1991, 2000, 2001). To obtain these figures, the MoWLD count the population of a village/street covered if a water scheme has been implemented there (be it a shallow well or a piped system with a number of tap-stands). One might expect a household level

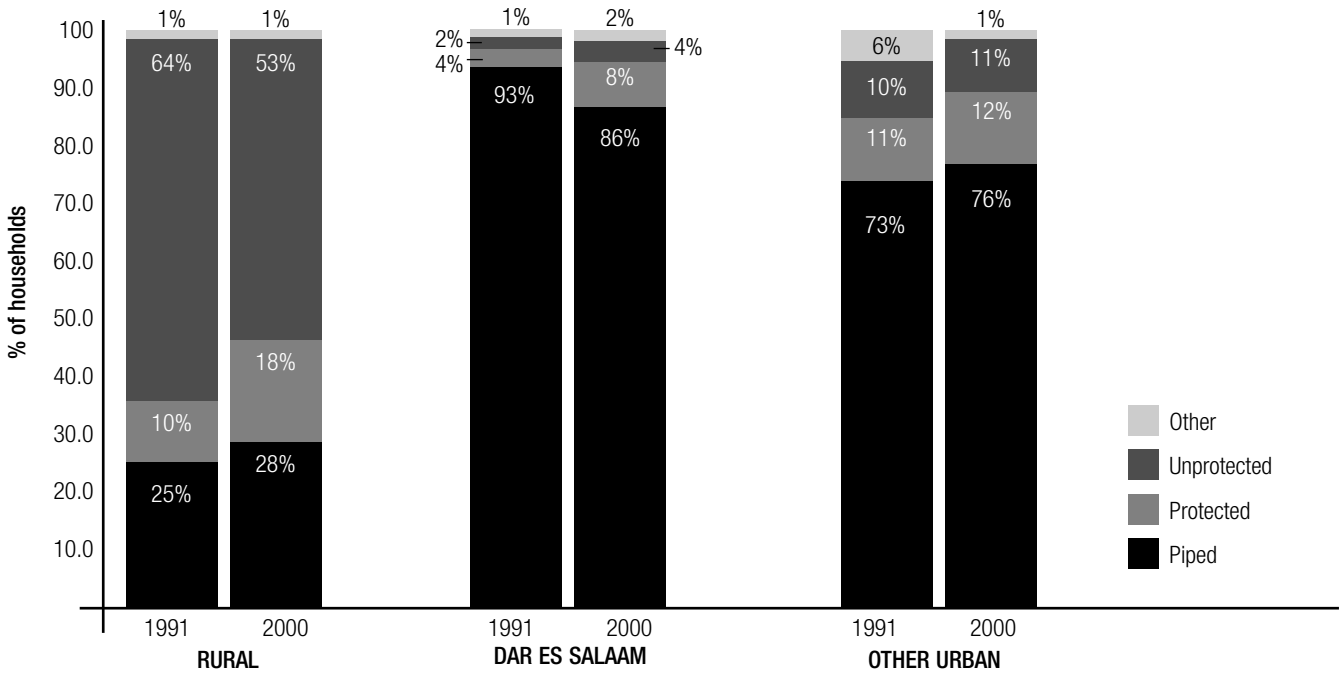
survey to give far lower figures than the 'one water point - all covered' method - the reasons why this has not occurred need further exploration.

3.2.3 Use of improved water sources for drinking by rural, urban and Dar based households

Figure 3.2.3 below shows the following trends:

- Use of improved water sources for drinking has increased for all areas except Dar es Salaam.
- **Rural** areas show the greatest improvement between 1991 and 2000 (source 1991 and 2000/1).
- **Urban** areas (other than Dar es Salaam) show little improvement. The 1991-2000 trend is affected by the 6% of households recorded as using 'other' water sources in 1991 (this other figure is generally between 1 and 3%)
- **Dar es Salaam** residents use of water from improved sources (piped plus protected) declined. The percentage using improved sources declined from 97% to 94%. This decline is due to a decline in piped water use (93% in 1991 to 86% in 2000). People appear to have shifted water source use from the supply network to other types of sources.

FIGURE 3.2.3. Change in use of piped protected, unprotected and other water sources for drinking 1991– 2001from HBS



REFLECTIONS ON THE TRENDS

Many of the possible explanations for the trends are those given in section 3.1 on water source use, especially related to piped water: technical (sample-based) explanations, changes in investment and policy and possible increased willingness and ability to pay for improved services. However, analysing the data using the piped and protected categories highlights the importance of not accepting the trends for those using piped water as giving the whole picture of those using improved. In Dar for example, many households appear to have shifted from using piped water to using both unprotected and protected other sources. This is likely to have been a result of the 1997 water supply emergency in Dar es Salaam during which many boreholes were drilled.

In rural areas, the percentage of households using protected sources accounts for most of the increase in use of improved water sources (8% of the 11% increase). This is partly explained by the realisation by most sector players that investment in large scale, high maintenance schemes in rural areas is not sustainable. Instead many sector investors have turned to other solutions such as protected wells. The distance to water statistics in section 3.4 do not suggest that this move to point sources from piped distribution systems has led to people traveling much longer distances to water.

Dar es Salaam

The importance of considering Dar separately from other urban areas is evident here. However, the figures for the city also provoke questions. WaterAid, Concern Worldwide and others in the Advisory Team have significant experience working with lower income communities in Dar es Salaam. The reduction in piped water use is not surprising given the knowledge about the standard of the pipe network and the fact that DAWASA serves largely higher income households and industry. What is surprising are the high percentages of households recorded to be using the piped system in both years: recent WaterAid research in *3 wards of one Municipality (Temeke)* estimates that *only 30%* of the residents use the piped system. Note that the wards covered in this study all have low income informal settlements and that the percentage should be taken as a preliminary case study not a statistically representative sample. This is likely to be due in part to the rapid growth of the city over the last 10 years and the failure of the sampling to pick this up - section 3.2.2 indicates that over 1 million people are missing from the statistics used.

3.3 Distance and time to water source

The presence of a water source, improved or unimproved, is a poor measure of whether people actually have access to safe water, as the Participatory Poverty Assessment (1995) provides "dramatic evidence" to support. In addition, the Human Resources Development Survey 1993 revealed that in two thirds of villages where poor households were using water from improved sources they still mentioned lack of water as a major problem. Unfortunately the national surveys analysed in this study do not tackle the acceptability and reliability of sources. However, people will cite water, even from the most reliable and high quality source, as a problem if that source is located far from the home or if it takes a long time to fetch the water. Both time and distance measures give a partial indication of the burden of domestic water management felt mainly by women and children in Tanzania and an indication of time that could be spent on more productive and social activities.

3.3.1 (Not) measuring the policy target - estimating distance

Surveys in Tanzania are not consistent in their measurement of time and distance to water sources: the HBS focuses on time (in 2000/1 only) and distance (1991 and 2000/1) to reach the dry season drinking water, the DHS records time taken to go, collect water and return home. Despite measuring distance, the HBS coding does not allow measurement of the National Water Policy target of water within 400m of the home. The nearest coding bracket is "less than 1km". Even if the coding allowed, estimation of any distance it is difficult for people to estimate distances. One method is to take an estimation of journey time, remembering that this is time to water in the dry season. The data for time to a water source shows how people estimate their journey times into round figures: 5, 10, 15, 20, 30, 45, 60 minutes etc. To walk 400m takes approximately 10 minutes although this is unlikely to be true if you are very old, injured, pregnant or carrying a very heavy bucket. If this measure is taken with HBS, 2000/1 data:

- 78% of urban households travel for 10 minutes or less for drinking water in dry season
- 51% of rural households travel for 10 minutes or less for drinking water in dry season

- 57% of all mainland households travel for 10 minutes or less for drinking water in dry season.

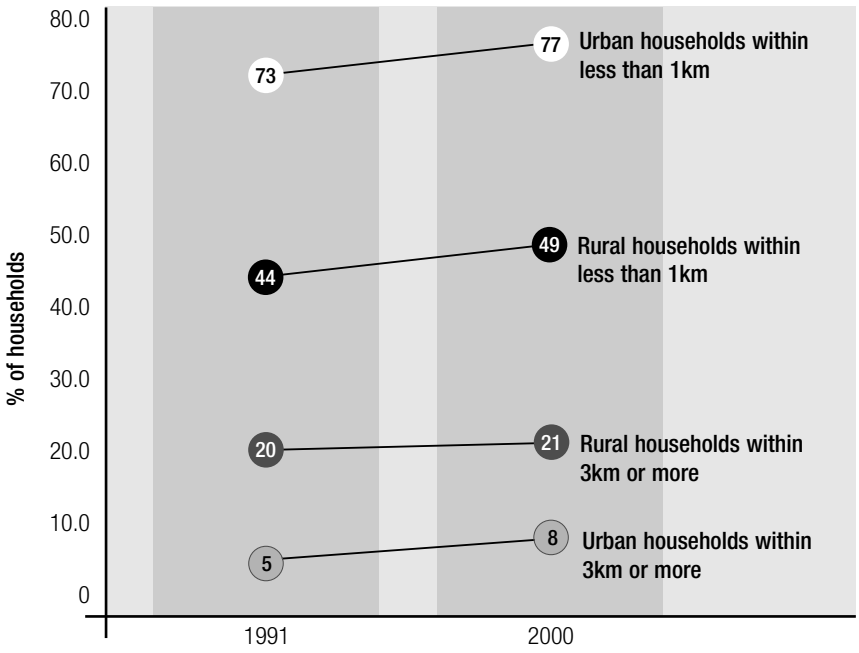
3.3.2 Trends in distance to water in the dry season

Table 3.3.1 shows the percentage of households with a dry season drinking water source less than 1 km from the home. It has increased in both urban and rural areas from 1991 to 2000 (3% and 5% respectively). The percentages of households with the source 1km or 2km away have fallen. Those with the source 3km or more have generally increased or not changed. For households with the source WITHIN 1KM (italics, less than 1km plus 1km), the situation has not changed between 1991 and 2000. This figure and those within 3km or more are plotted in Figure 3.3.1. Both urban and rural households have experienced similar rates of change although the disparity between the two areas is evident.

TABLE 3.3.1 Percentage of households with drinking water in dry season within certain distance (source HBS 1991 and 2000/1)

DISTANCE (km)	URBAN		RURAL	
	1991	2000	1991	2000
< 1km	73.4%	76.5%	43.8%	49%
1km	14.4%	10.4%	25%	21.1%
within 1km	87.8%	86.9%	68.8%	70.1%
2km	6.8%	5.2%	11.2%	9.3%
3km	1.5%	3.9%	7.1%	8.8%
4km	1.3%	1.5%	3.8%	2.4%
5+km	2.6%	2.5%	9.1%	9.3%
Total	100%	100%	100%	99.9%

FIGURE 3.3.1 Change in distance travelled by households to fetch water in rural and urban areas 1991-2000/1 (HBS)

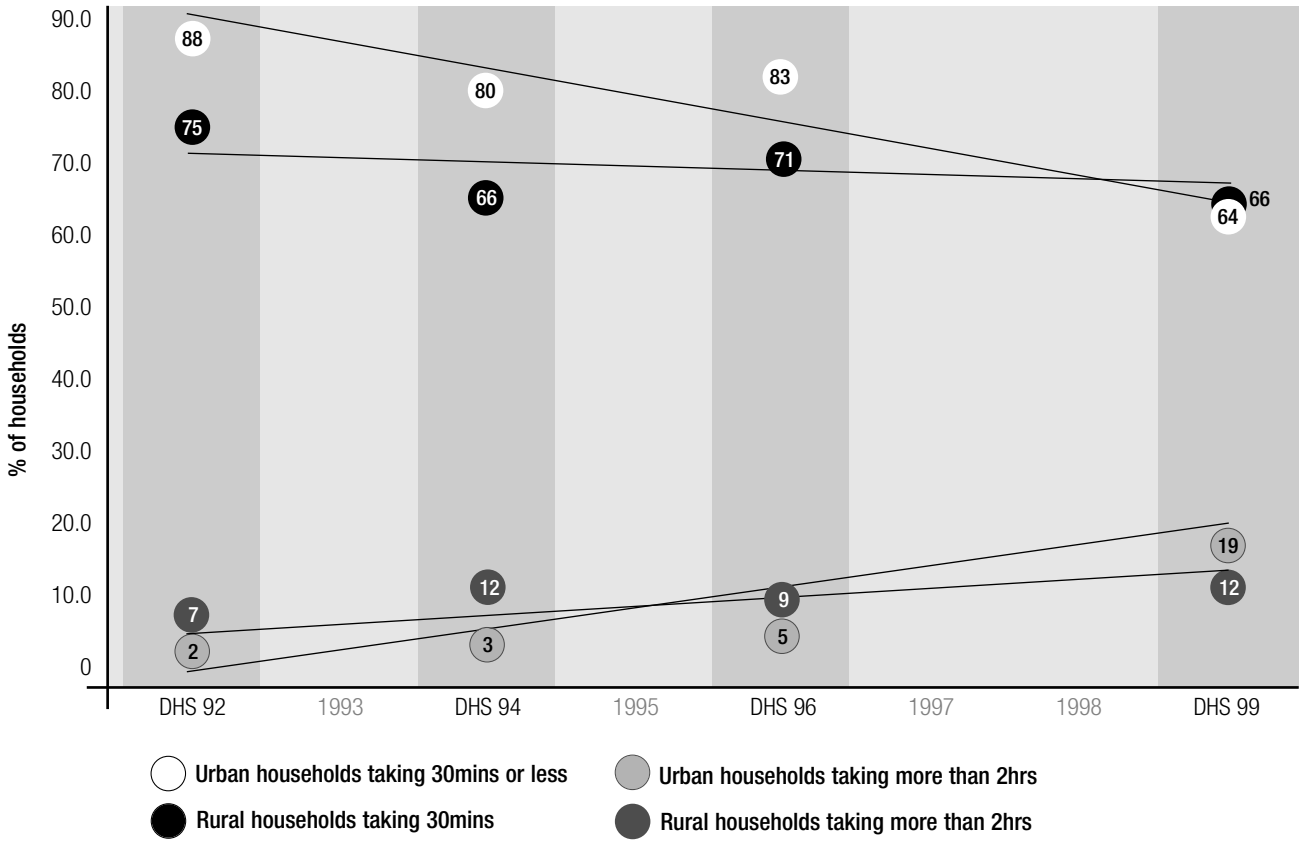


3.3.2 Trends in time taken to fetch water

The indicator 'time to fetch water' is measured by the DHS and captures the rounds trip - going to the water source, waiting, collecting water and returning home. The data gives a better picture of the burden of domestic water management as it captures waiting times at water points. For the purposes of the study, 30 minutes was taken as the cut-off point to represent those taking relatively less time to fetch water. Cairncross and Feacham (1993) state that observation of people's behavior in various rural settings suggests that water use does not increase as distance to the source is reduced until it is less than 100m. However, they (a) suggest a correlation between a distance of "within about one kilometer" and "within half-an-hour's return journey of the home" and (b) show that consumption falls for households more than 30 minutes return journey time from source.

Figure 3.3.2 shows that between 1991-1999, the percentage of households taking 30 minutes or less fell, particularly in urban areas. Conversely, those households taking more than 2 hours to fetch water has increased, again the trend being more pronounced for urban households (source: DHS). Given that distances to water have not increased significantly over the 1990s it appears that pressure on the water points, causing queues for water is the likely explanation. The implications for the time and productive energy levels of women are great.

FIGURE 3.3.2 Change in time taken to go, collect water and return 1992-99



3.4 Regional differences in use of and distance to water sources

3.4.1 Regional differences in use of improved water sources

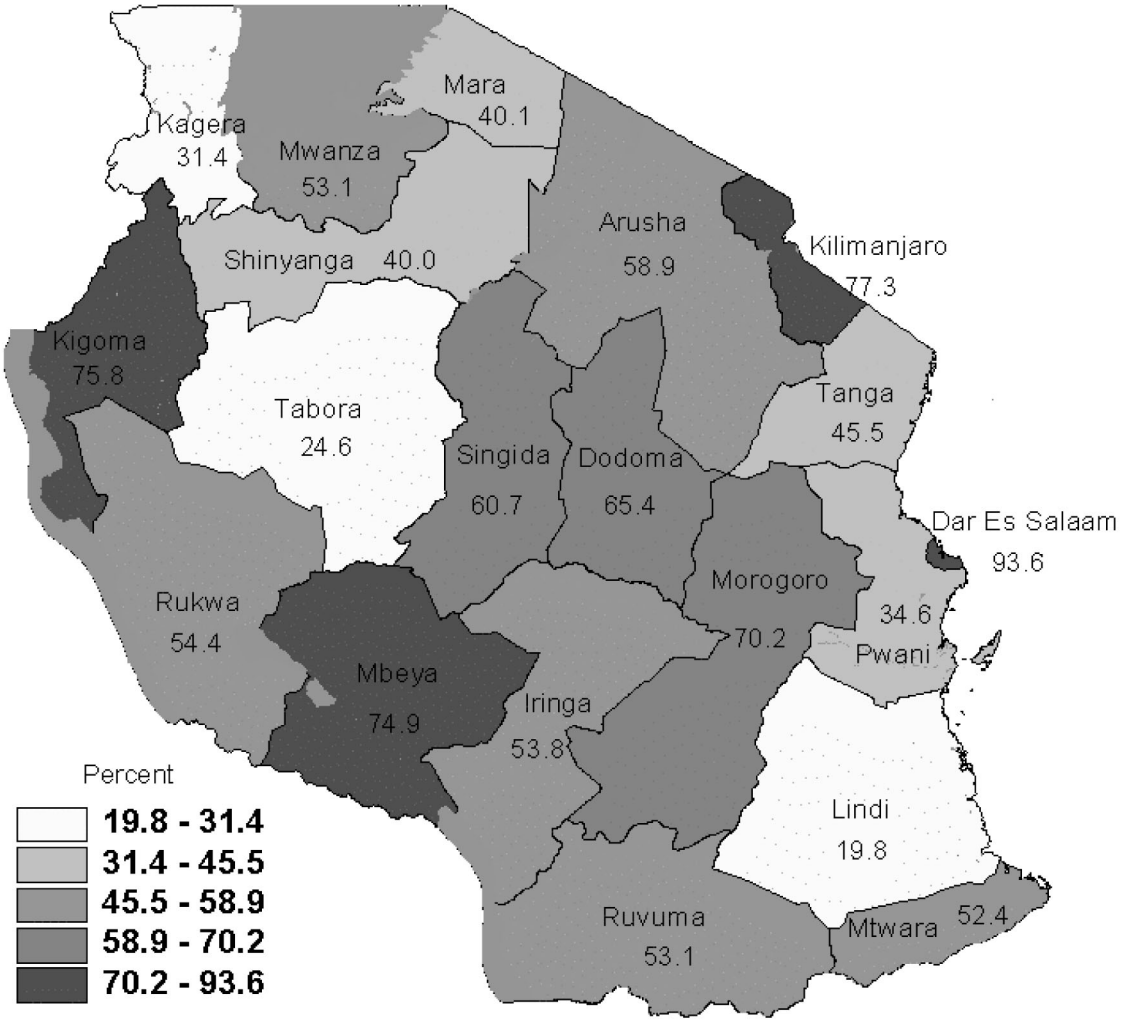
Refer to table 3.4.1, map 3.4.1 and 3.4.2. The source for this whole section is the HBS 2000/1. It must be recognised that this regional disaggregation hides vast intra-regional (intra-district, intra-ward, intra-village/street and intra-household) differences. It is recommended that this study is supplemented by an analysis of the District level data from the Census 2002 in order to produce a more useful analysis for planners and local service providers. However, regional-level disaggregation is very useful in providing information on geographical disparities.

TABLE 3.4.1 Regional percentage of households using improved water sources (total and rural) in rank order (the top in each list being the region with the 'better' figures

NAME	% of **rural** households with access to **improved water sources** (piped. protected wells and covered springs) (source: HBS 2000/1)	NAME	% of households using **improved water sources** in region (piped. protected wells and covered springs) (source: HBS 2000/1)
Kilimanjaro	74.1	**Dar es Salaam**	93.6
Kigoma	73.9	**Kilimanjaro**	77.3
Mbeya	66.0	**Kigoma**	75.8
Morogoro	61.6	**Mbeya**	74.9
Dodoma	60.4	**Morogoro**	70.2
Singida	58.9	**Dodoma**	65.4
Iringa	50.5	**Singida**	60.7
Arusha	48.0	**Arusha**	58.9
Rukwa	47.8	**Rukwa**	54.4
Ruvuma	46.1	**Iringa**	53.8
Mtwara	44.6	**Ruvuma**	53.1
Mwanza	44.6	**Mwanza**	53.1
Tanga	41.4	**Mtwara**	52.4
Shinyanga	37.0	**Tanga**	45.5
Mara	29.5	**Mara**	40.1
Kagera	29.0	**Shinyanga**	40.0
Pwani	23.4	**Pwani**	34.6
Tabora	13.2	**Kagera**	31.4
Lindi	11.4	**Tabora**	24.6
Dar es Salaam	not applicable *	**Lindi**	19.8

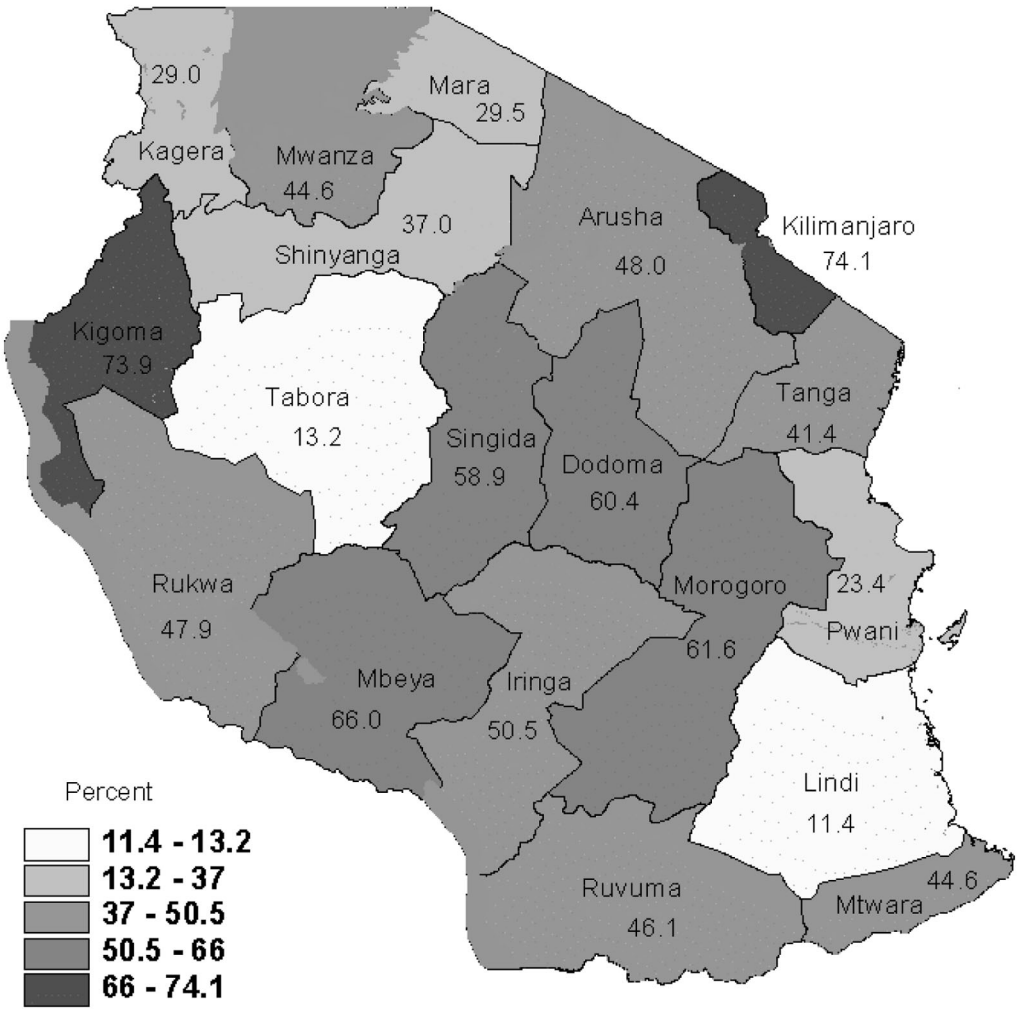
* according to NBS Dar es Salaam classified as urban only

MAP 3.4.1. Percentage of households (urban and rural) using improved (piped and protected) water sources as their main drinking water source by region (source: HBS 2000/1)



NOTE: The bands were created to best fit the natural groupings within the data as this best highlighted the patterns. This does, however, make the band figures look odd! Furthermore, the lower figures of each band should read 19.81, 31.41, 45.51, 58.91, 70.21. Kagera for example, with 31.4% falls in the lowest band.

MAP 3.4.2. Percentage of rural households using improved (piped and protected) water sources as their main drinking water source by region (source: HBS 2000/1)



NOTE: As above, the bands were created to best fit the natural groupings within the data as this best highlighted the patterns. This does, however, make the band figures look odd! Furthermore, the lower figures of each band should read 31.21, 37.01, 50.51, 66.01. Tabora for example, with 13.2% falls in the lowest band.

The following patterns are visible:

- The rank orders (total households and rural households, table 3.4.1) are very similar. Despite migration into urban areas, the majority of households in mainland Tanzania are still rural.
- Dar es Salaam has the highest percentage of households using improved sources (around 93%). This is higher than Kilimanjaro, the region with the next percentage, by 16%. Remember, however, our reservations over the figures.
- Kilimanjaro and Kigoma both have over 75% of total households and over 73% of rural households who use improved water sources. These are followed by Mbeya, Morogoro, Dodoma and Singida (60-75% of total households and 58-66% of rural households)
- The survey records that Tabora and Lindi regions both have less than 25% of total households and 14% of rural households using improved water sources in 2000/1. Pwani, Kagera, Mara and Shinyanga have less than 42% for total households and less than 40% of rural households using improved water sources.
- 12 of the 20 regions have a regional percentage of households using improved water sources that is beneath the national percentage of 55.5%.
- Some regions show a larger 8-12% difference between the total regional percentage and the rural percentage. This indicates that these regions have large inequalities between urban and rural areas (particularly Mara, Pwani and Tabora) or very high percentages of urban households using improved sources (eg Arusha).

3.4.2 Regional differences in time to water sources in the dry season

This is not related to the improved source as above - you cannot look at the different regions' percentage of households using an improved water source that is 15 minutes away. Table 3.4.2 shows the percentage of households with a drinking water source in the dry season within 15 minutes. Note that the top five regions (those with more households within 15 minutes) are Dar, Ruvuma, Mbeya, Iringa and Kigoma. Compare these with those regions positions' in the ranking for the total percentage of households using improved sources: Dar, Mbeya and Kigoma are consistent but Ruvuma and Iringa both have only 54% of households using improved sources for drinking, below the national figure of 56%. Conversely, Kilimanjaro is near the bottom of this table but ranks very highly for use of improved water.

WHY THESE PATTERNS?

1. Patterns of investment

There is some correlation between improved access to water and large-scale government/international funding. From the Advisory Team's collective experience, the budget speeches acknowledging support and Therkildsen's (1988) assessment of donor funded rural water supply programmes the following links can be discerned:

- Kilimanjaro - GTZ/KfW
- Morogoro - Dutch
- Mbeya - Dainish
- Dodoma - and WAMMA (government and WaterAid)
- Singida - Lutheran Church Federation and TCRS

In addition, Kigoma has had significant investment from the government in partnership with Norway, Germany and JICA. Kigoma's high coverage figures may also be linked to the refugees' supplies and provision to the surrounding host villages. However the emergency link does not hold true for Kagera. Kagera has also had a lot of investment in partnership with SIDA through the HESAWA programme but surprisingly has a very low percentage coverage (31%). Interestingly, the two regions that ranked highly on the *percentage of households within dry season water within 15 minutes* - Ruvuma and Iringa - are mentioned in Therkildsen's analysis of the DANIDA's work. In Lindi on the other hand, recipient of significant Finnish support to rural water in the 1970s and early 1980s, Therkildsen's study reports that most of the schemes have broken down due to poor maintenance and management. Tabora Region has not seen much large-scale investment for water.

2. Water resource availability

Kilimanjaro, Mbeya and Morogoro are all mountainous and so, at least in parts, have more springs; a water source that is relatively cheap to protect and distribute water from to settlements using gravity. Maintenacne costs in those areas are therefore likely to be far lower than for areas reliant on pump engines. However, Dodoma and Singida, both with relatively high coverage of improved sources, are both located in semi-arid areas and are largely reliant on deep groundwater aquifers.

3. Data issues

We should not rule out sample design and errors when looking for explanations.

TABLE 3.4.2 Regional differences in percentage of households whose nearest drinking water source in the dry season is within 15 minutes

NAME	% of households in region whose nearest drinking water supply in the dry season is within 15 minutes (source: HBS 2000/1)
Dar es Salaam	89.7
Ruvuma	88.3
Mbeya	77.5
Iringa	77.1
Kigoma	72.5
Dodoma	71.3
Morogoro	70.7
Rukwa	69.7
Singida	68.4
Pwani	67.3
Lindi	67.3
Arusha	65.8
Kilimanjaro	61.8
Tabora	60.1
Mwanza	55.0
Kagera	53.8
Tanga	53.7
Shinyanga	53.3
Mara	51.1
Mtwara	44.1

4.0 Sanitation in Tanzania

4.1 Use of toilets in Tanzania

Are we seeing *vyoo vya bwana afya* - the health workers latrines?

It is broadly recognized by all actors working in the sector that, in order to have a real impact on health, water supply programmes should integrate sanitation and hygiene promotion. Unfortunately, a lack of useful data on sanitation prevents a detailed consideration of trends over time and space or more detailed analysis of the relationships between sanitation and other variables. By a lack of useful data, we mean:

- That the earlier surveys do not have comparable data (HBS 1977 and Census 1978).
- That the survey questions do not generate information except use (or ownership) of toilet facilities
- That the response options are: flush toilet (shared or private for some), VIP, pit latrine, no facility (and bush or field) or 'other'. Experience with communities tells us most people do not know what a VIP is. This is reflected in the survey figures that show very low percentages using VIPs, which in turn is unlikely to reflect the numbers of households that have made improvements to their basic latrines.
- The Census, DHS and HBS, all use largely comparable response options, but differ in question wording: Census and DHS ask about the toilet facility that a household **has**, the HBS asks about **use**.

The basic results shown in figures 4.1.1, 4.1.2 and 4.1.3 overleaf show the following results:

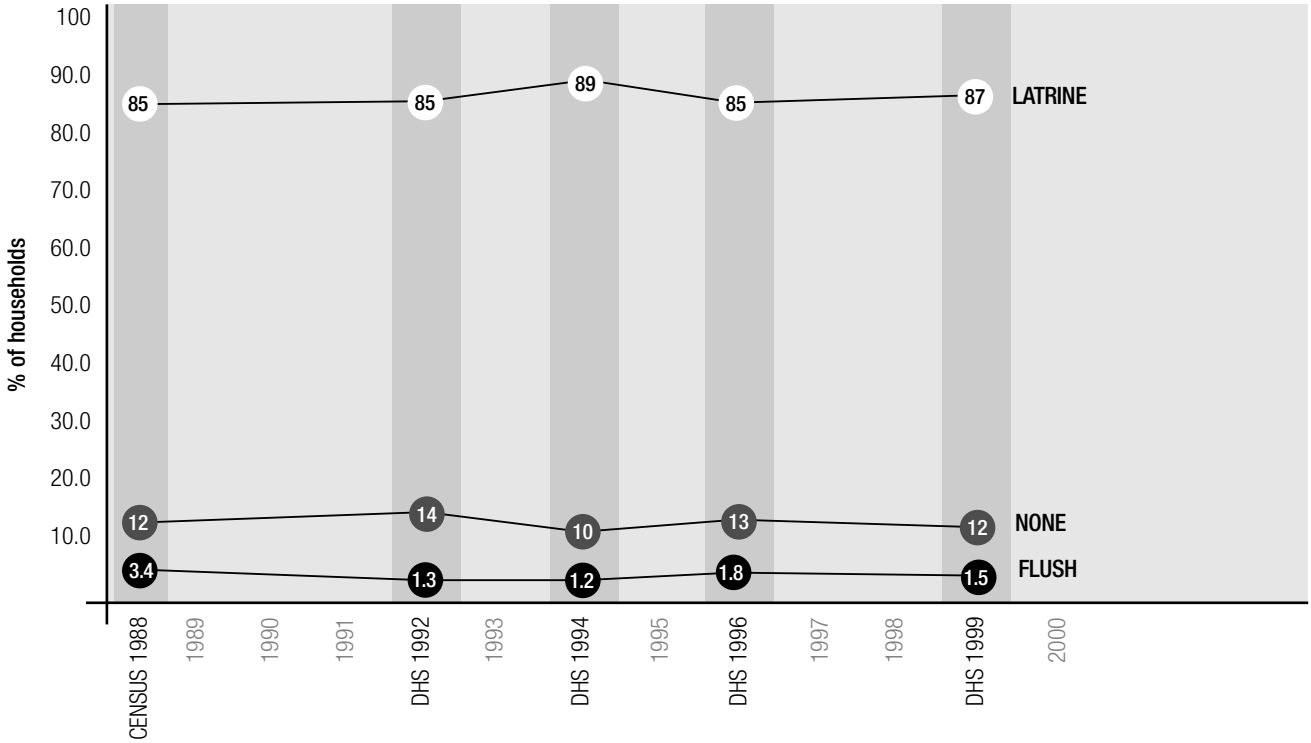
- Not much change! The percentage of households owning a toilet facility fluctuates between 84% and 89% in the DHS and Census from 1988 to1999.
- HBS shows no change in the percentage of households using a toilet compared with those not using a facility through the 1990s.
- The use of flush toilets remains low.

The Advisory Team generally agreed that the percentages of households using toilet facilities is not likely to be as high as the figures indicate. Perhaps what we are seeing the *vyoo vya bwana afya* - toilets of the health officers, that were built but never used, or were said to exist when they didn't, to satisfy by-laws on sanitation established even before independence.

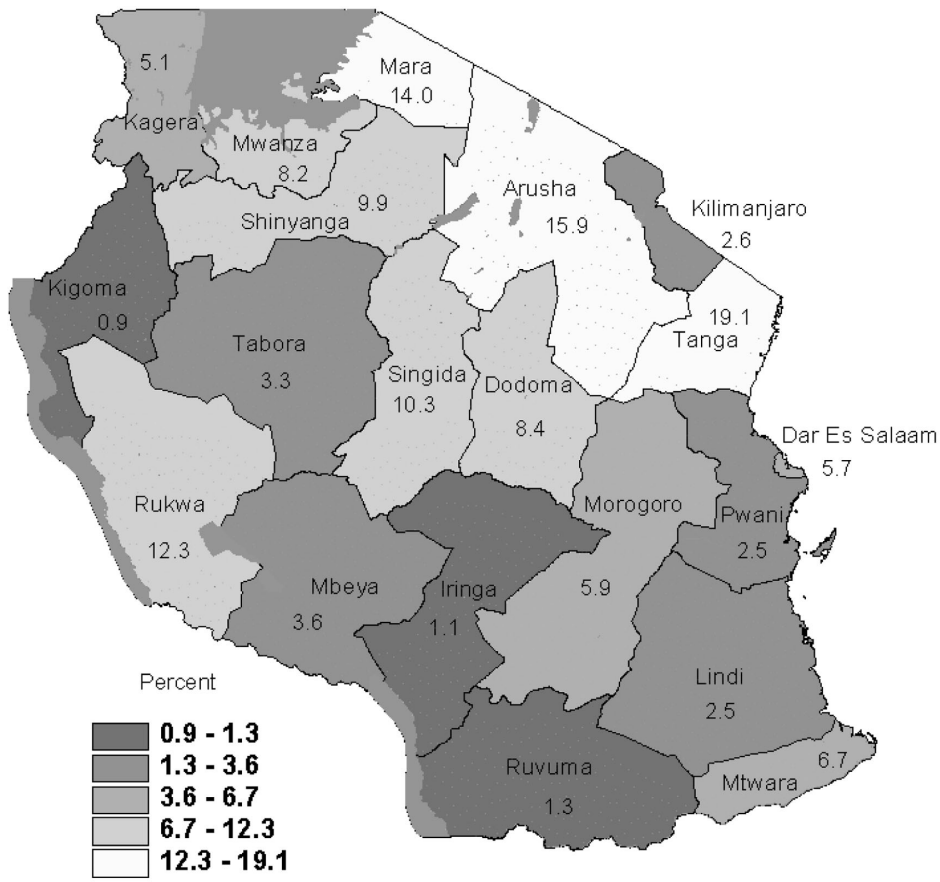
Furthermore, the VIP option is too specific but the pit latrine category (by far the most common type of toilet used) is too broad, including both well built and well kept sanitary facilities and those latrines with collapsing pits, unsafe logs and mud on top and that are not kept clean.

Map 4.1.1 shows regional patterns for percentage of households with toilets. The lighter the colour of the region, the more households there are without facilities. The northern regions clearly have lower percentages than others. However, given the issues with the data questions, we cannot read too much into these patters.

FIGURE 4.1.3 Percentage of households in Tanzania Mainland using different toilet facilities over time.



MAP 4.1.1. Percentage of households with no toilet facilities by region (HBS 2000/1)



5.0 Water, sanitation, gender and income poverty

5.1 Gender and water and sanitation in the surveys

5.1.1 What participatory research tells us

Women are usually the domestic and, increasingly, the community-level water managers in Tanzania. There are an increasing number of female-headed households in the country, for a number of reasons including HIV/AIDS and changing social behaviour. In 2000/1 22% of households were headed by women, up from 18% in 1991 (source: HBS 2000/1, HBS 1991). They are often perceived to be poorer in many ways than male headed households. Experience from community based programme work and research indicates that particular female-headed households can be particularly vulnerable to being denied access to water services. The common unequal distribution of physical (land, property etc) and financial assets following a divorce or a man's death is one reason given. The 1995 PPA looked at classifications of poverty with regard to impoverishing processes for the various social groups:

- "if a woman is widowed her life prospects immediately change for the worse"
- "in most areas, a woman lost everything in divorce"

This study, however, indicates that female headed households do not appear to be worse off than male headed households in terms of use of protected and piped water sources. In fact survey results indicate that more female headed households use protected sources than male headed households in both rural and urban areas. Both HBS and DHS were used for comparison, so 'piped' and 'surface water' were analysed.

5.1.2 Female headed households and piped water

Piped water often reflects percentage using protected water sources and, as most piped supplies involve financial contributions for O&M, female-headed households might be expected to have lower access than males. Yet a higher percentage of female-headed households use piped water sources than male-headed households (see figure 5.1.1). This may relate to the fact that the preliminary HBS results show that female-headed households are no poorer (in terms of the food and basic needs poverty lines) than male headed households.

FIGURE 5.1.1 Change in percentage of male and female headed households using piped and surface sources for drinking water 1991-2000/1 (HBS)

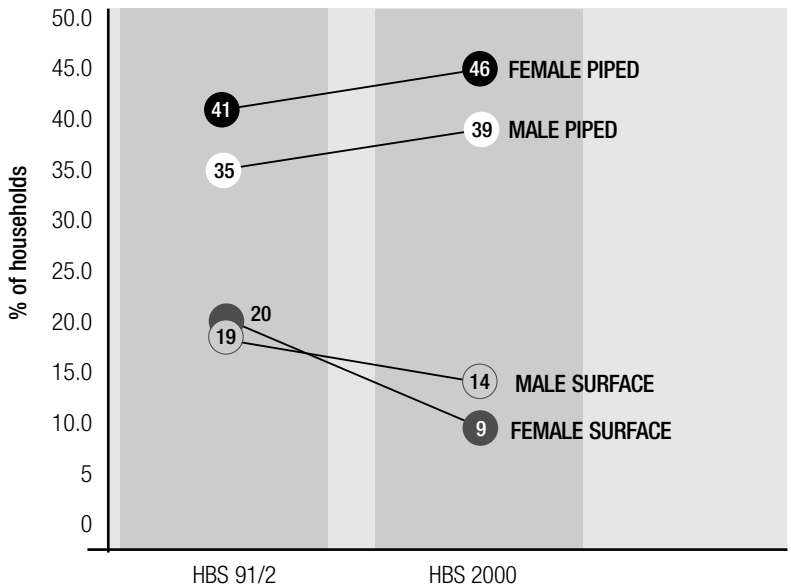
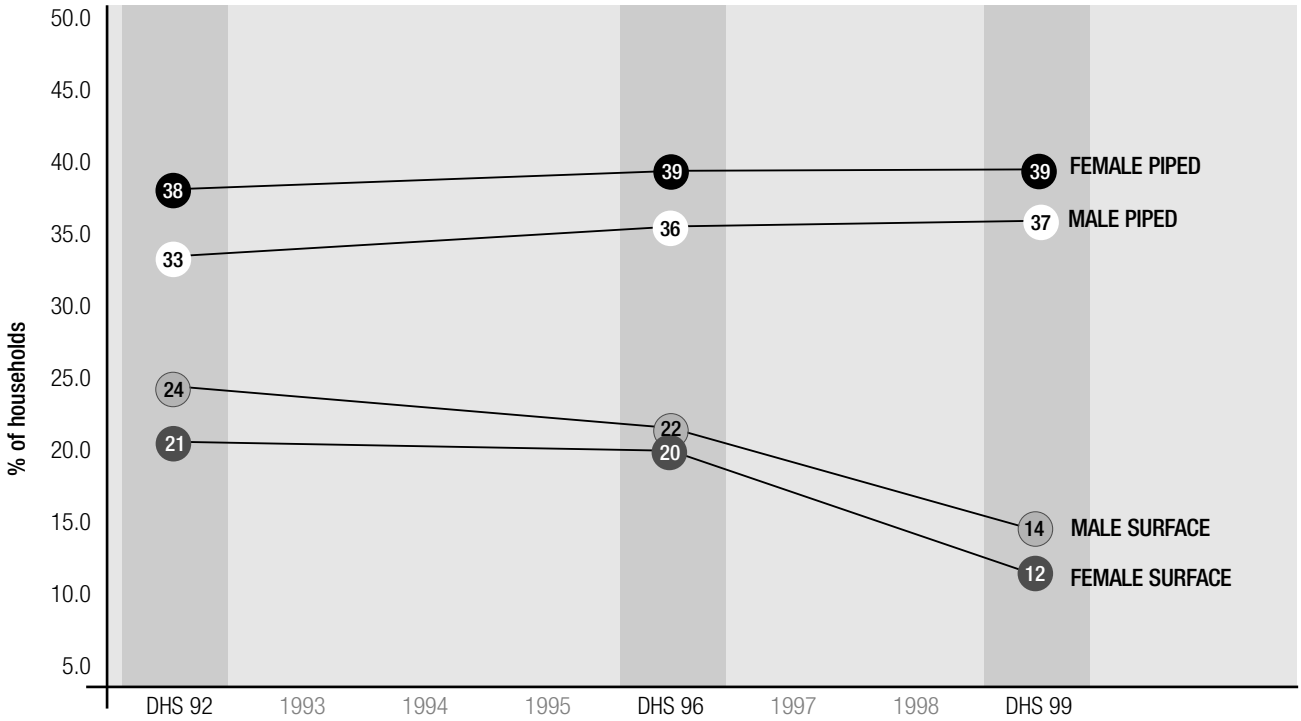


FIGURE 5.1.2 Change in percentage of male and female headed households using piped and surface sources for drinking water 1991/2-1999 (DHS)



In 2000/1 45.8% of female-headed households, 38.6% of male headed households used piped water.

- In rural areas 33.7% of female-headed households and 26.7% of male-headed households use piped water. In Dar and other urban areas, the difference is not as great (HBS 2000/1).
- The higher percentage of female-headed households using piped water is evident throughout the 1990s.

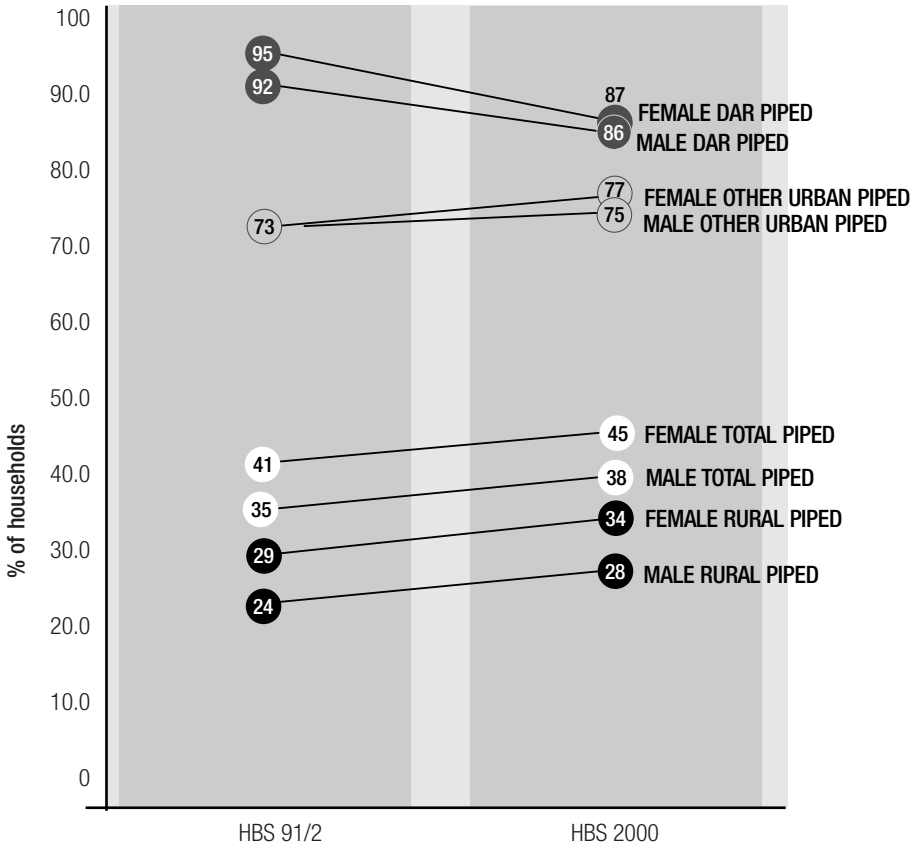
The use of piped water has increased throughout the 1990s for both sexes of head of household but note that the surveys differ on the rate of change that can be plotted (comparing figures 5.1.1 and 5.1.2):

- The HBS figures are consistently higher than the DHS (1991/1 both surveys carried out over same time period, then DHS in 1999 and HBS 2000/1). Sampling differences are likely to account for this.
- The HBS figures show a greater rate of change in use for all female headed households:
- HBS: 40.7% in 1991 to 45.8% in 2000/1 (change of 5%).
- DHS: 38.5% in 1991/2 to 39% in 1999 (less than 1 % increase)
- The DHS indicates that the increase in use is greater for male-headed households than female. The HBS figures show the opposite. However, remember that the percentages are small.

Use of piped water has increased throughout the 1990s in all areas except Dar es Salaam for both sexes of head of household. The rate of increase is greatest for female-headed households in rural areas as the graph 5.1.3 overleaf shows. Both male and female headed households show the same trends through the 1990s:

- an increase in piped use in *rural* areas (5% increase for female headed households and 3% increase for males);
- an increase in *urban* areas (other than Dar) of 3.8% female and 2.4% for male headed households;
- a decline in use of piped water in Dar (8% decrease for female, 7.1% for male).

FIGURE 5.1.3 Change in percentage of households using piped water for drinking by sex of head of household and strata 1991-2001 (HBS)



5.1.3 Female headed households and use of surface water

Figure 5.1 shows that in 2000, a higher percentage of male-headed households used surface water sources for drinking than female-headed households. In 2000/1 9.4% of female-headed households, 19.7% of male-headed households used surface water. In rural areas 11.6% of female-headed households and 17% of male-headed households use surface water. In Dar and other urban areas, the difference is very small (HBS 2000/1). The higher percentage of male-headed households using surface water is evident throughout the 1990s (except in 1991 HBS which records female-headed households' use 1% higher).

Use of surface water has decreased throughout the 1990s for both sexes of head of household and again surveys differ on the rate of change (comparing 5.1.1 and 5.1.2 again):

- Note that the HBS figures are higher than the DHS.
- The HBS figures show a greater rate of change in use for all female-headed households: 19.7% in 1991 to 9.4% in 2000/1 (change of 10.3%). This decrease is far greater than that for male-headed households which fell from 18.7% to 14.3% (4.4%).
- The DHS shows a more similar change between the sexes: 21.2% in 1991/2 to 12.4% in 1999 (a fall of 8.8%) for female-headed households and 24.5% to 13.6% (10.9%) for male headed households. The DHS shows a greater rate of decline in the late 1990s than the early 1990s.
- However remember that the wording for the question changed for the DHS 1999, bringing the options offered to respondents more in line with the HBS. It appears that the DHS was generally over-estimating surface water use as people classified some shallow wells as surface sources (in 1999 they become open, unprotected wells).

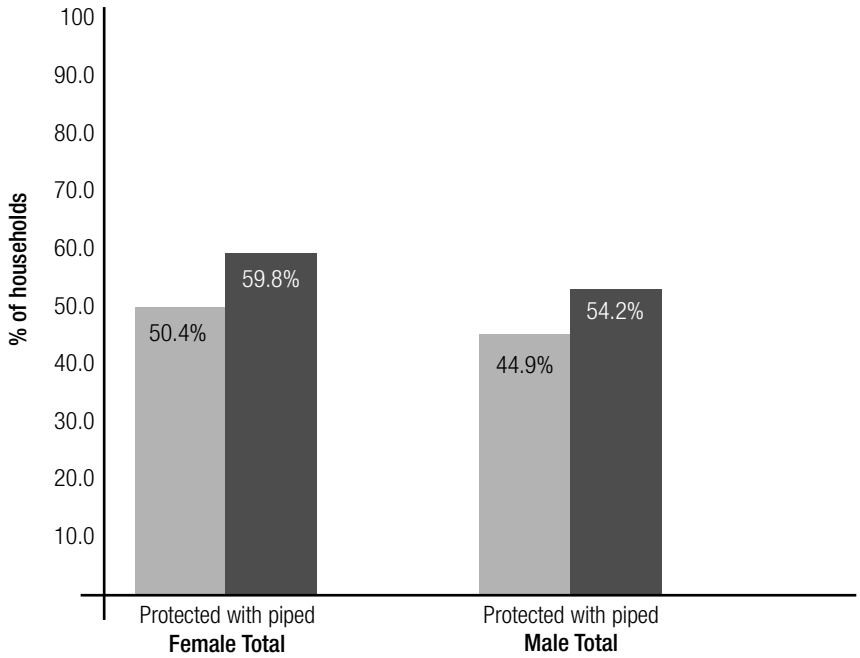
Just as the difference between male and female-headed households using piped water appears greatest in rural areas, so does the difference between those using surface water.

5.1.4 Female-headed households and use of improved water

As you might expect, this follows the general trends of piped water use (see figure 5.1.4):

- In 2000/1 a higher percentage of female-headed households in Tanzania using improved water sources for drinking - 59.8% female-headed households, 54.2% male-headed households (HBS 2000/1)
- There has been an increase for rural and urban areas in the use of improved water but a decrease for Dar for both sexes. Again, the difference between male and female-headed households was more pronounced for rural than for the others.
- Interestingly, when you look at protected water sources not including piped supplies, there is very little difference at all in male and female use of the sources (protected wells and covered springs).

FIGURE 5.1.4 Change in use of improved water sources for drinking by male and female headed households 1991 - 2000/1 (HBS)



Possible reasons for difference:

- It is possible that women, when heading a household, chose protected water sources and prioritise water within the household budget.
- Sample differences. The DHS and HBS have different purposes. The DHS is focused on maternal and child health and enumerators actively seek out females for the women's survey. Either this survey over-samples as a result OR it finds some of those that the HBS misses.
- Definitions of rural and urban (as with the explanation for piped water use, the 'rural' sample is perhaps reflecting peri-urban communities). Perhaps there are more female-headed households in those areas - this is not possible to tell from the surveys.

Technical implications:

The HBS generally gives a more favourable picture for female-headed households than the DHS, particularly in rural areas. The study still focuses on the HBS as use of improved sources can be analysed, however, it should be remembered that the trends are slightly different if the DHS is used.

5.2 Water in Tanzania and basic needs poverty

5.2.1 Basic needs poverty

The National Bureau of Statistics of Tanzania with OPML developed a Poverty Baseline for Tanzania and updated it using the HBS 2000/1. See NBS and OPML (2000) and the Annual Poverty and Human Development Report (2002) for an explanation of the Food Poverty line and the Basic Needs Poverty line creation, both based on household expenditure as a proxy for income poverty. For this study, the basic needs poverty line is used to analyse use of water source by household according to wealth. The limitation inherent to applying this type of analysis is that households with very similar expenditure fall either side of the poverty line as well as issues such as the expenditure levels of subsistence households not adequately capturing relative income (NBS and OPML 2000). For this section, the use of improved water is related to the population above and below the basic needs poverty line.

5.2.2 Basic needs poverty and use of improved (piped and protected) water sources

Figure 5.2.1 below shows that more households living below the basic needs poverty line use unprotected water sources than those above. More households above the poverty line use piped water than those below the poverty line. There is little difference for the use of protected water. Table 5.2.1 shows the use of piped, protected and unprotected sources by stratum.

FIGURE 5.2.1 Percentage of households using piped, protected, unprotected and other water sources that are above and below the poverty line (HBS 2000/1)

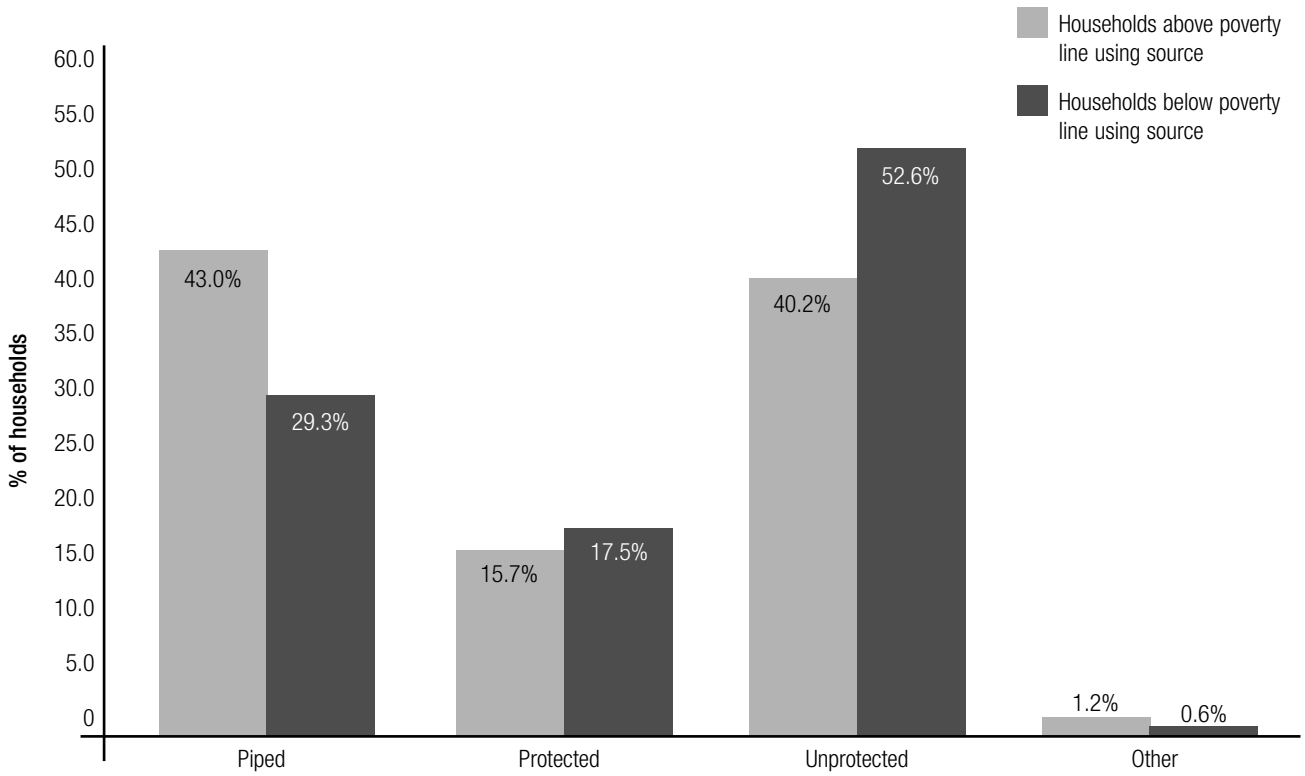


TABLE 5.2.1 Use of different water sources by households above and below the poverty line by stratum (HBS 2000/1)

	DAR ES SALAAM		URBAN		RURAL	
	Above the BNPL	Below the BNPL	Above the BNPL	Below the BNPL	Above the BNPL	Below the BNPL
Piped	88%	72%	78%	65%	30%	24%
Protected	7%	15%	12%	15%	18%	18%
Improved	**95%**	**87%**	**90%**	**80%**	**48%**	**42%**
Unprotected	2%	12%	9%	19%	51%	57%
Other	3%	1%	1%	1%	1%	1%
TOTAL	100%	100%	100%	100%	100%	100%

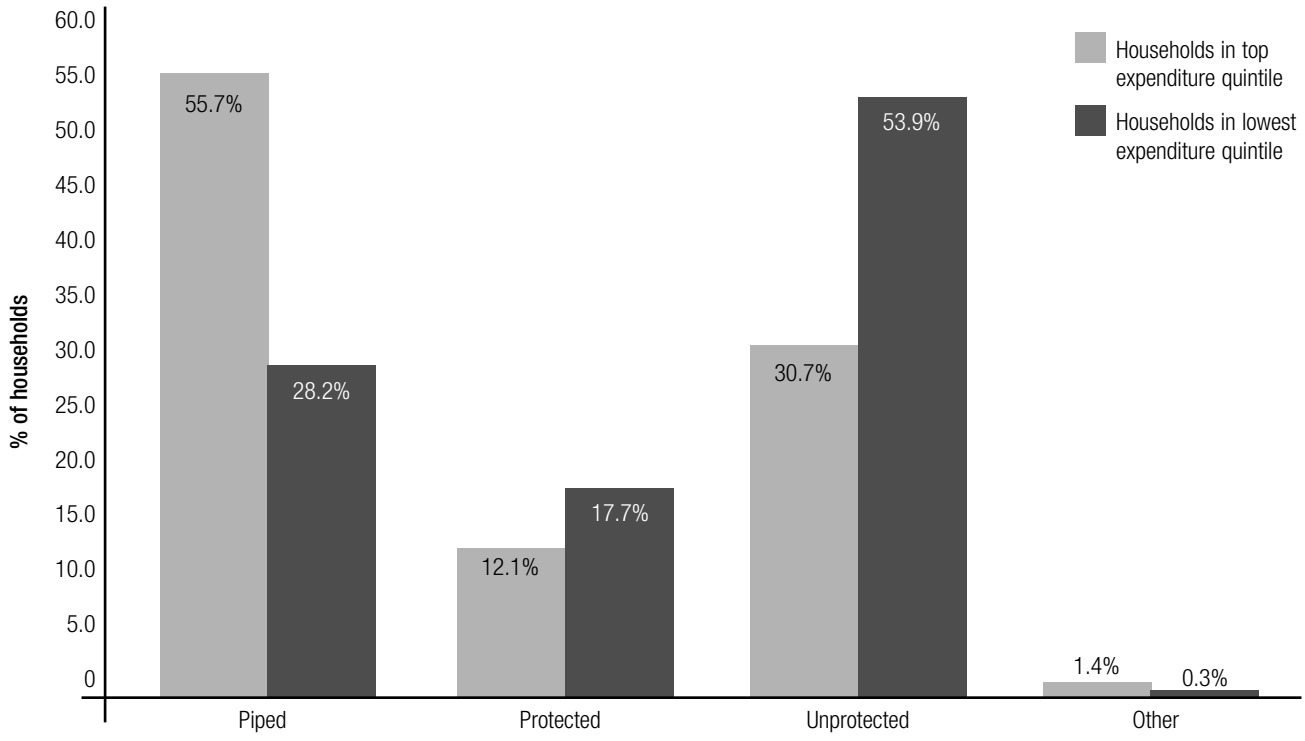
The following is apparent:

- That those households living below the basic needs poverty line are more likely to use *unprotected sources* for drinking no matter where they live. The difference is greatest between those above and those below in urban areas (both urban and Dar). The difference in rural is less, perhaps signifying the high level of poverty in rural areas.
- That in Dar es Salaam 16% less of those households below the poverty line, than those households above, rely on the piped water supply. Also note; though only 7% of households in Dar were recorded as using unprotected sources these households were six times more likely to be those below the poverty line.

5.2.3 Poverty quintiles and use of improved water sources

Household expenditure quintiles are created by sorting households into five bands each corresponding to one fifth of the households sampled; from those with lowest

FIGURE 5.2.3 Percentage of households using piped, protected, unprotected and other water sources that are in the lowest and the highest expenditure quintiles (HBS 2000/1).



expenditure, to those with highest expenditure. This allows us to gain a picture of the inequalities between households in different expenditure quintiles.

Figure 5.2.3 compares use of piped and protected water for the two extreme quintiles, top and bottom expenditure. However, the use of piped and protected sources by quintile analysis is not markedly different to the analysis by poverty line. This suggests that factors other than spending power may be masking inherent inequality in the use of sources.

5.2.4 Poorer households and their distance to water

TABLE 5.2.2 Distance and time to drinking water sources in the dry season (HBS 2000/1)

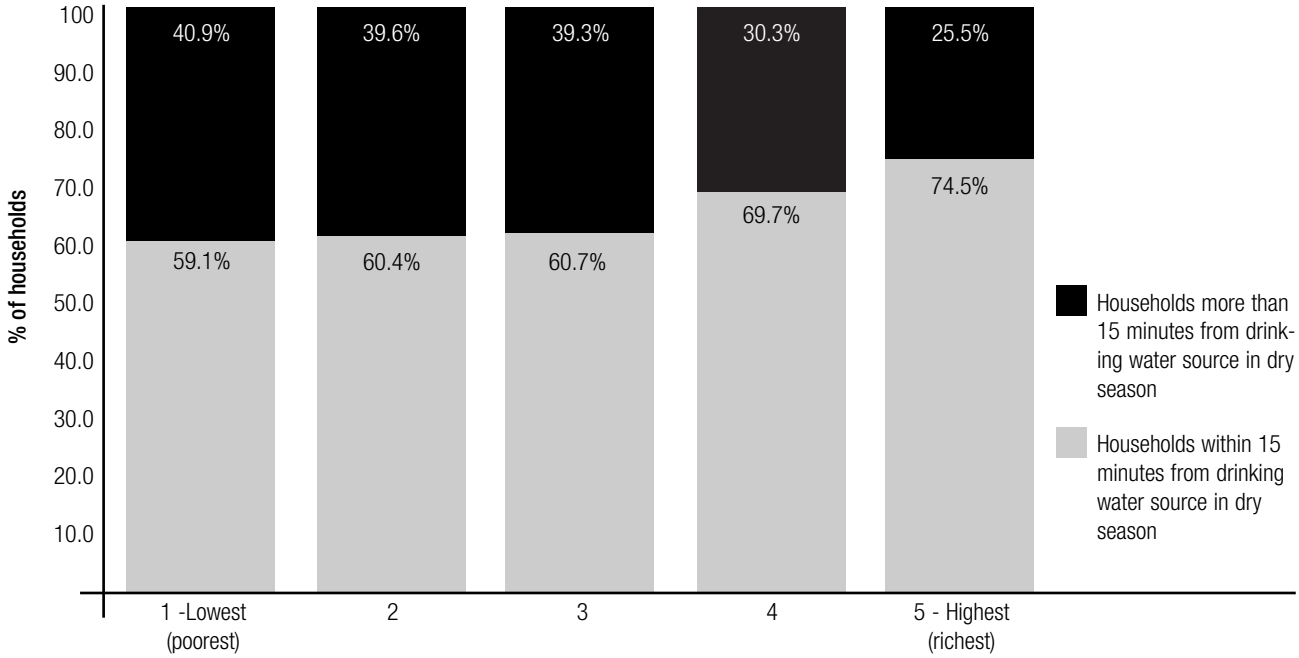
	Households below the poverty line	Households above the poverty line	Households in poorest quintile	Households in richest quintile
DISTANCE to drinking water in dry season				
Mean	1.6	1.4	1.6	1.3
Median	1	0	1	0
Mode	0	0	0	0
TIME to drinking water source in the dry season				
Mean	26.4	21.8	26.7	19.9
Median	10	10	10	8
Mode	5	10	5	10

Poorer households travel further for their water and spend longer collecting it. It is not accurate to use the mean as a stated average for distance to water as the distances are classified as 0, 1km, 2km, 3km, 4km etc. However, table 5.2.2 shows both the means and the medians do indicate that more poor households (those below the basic needs line and in the poorest quintile) travel further for their water than richer households. The modal value (the most frequently stated) is zero kilometers (less than 1) for both richer and poorer households.

For time to water, however, the mean and median can be used directly. Poorer households spend, on average, 7 minutes longer than richer households collecting water (27 minutes compared to 20 minutes, using the means for the lowest and highest quintiles of households). As figure 5.2.4 illustrates, 59% of poorer households (in the lowest quintile) take 15 minutes or less to collect drinking water in the dry season. 75% of richer households (in the highest quintile) take 15 minutes or less to fetch it.

It is interesting however that the modal value again does not follow this pattern, actually showing that the most common time spent by richer households to fetch water is 10 minutes compared with 5 for poorer. Remember that queuing time, not captured by this indicator, influences these figures in all, but especially urban, areas.

FIGURE 5.2.4 Percentage of households fetching water within 15 minutes in the dry season (source: HBS 2000/1)



5.2.5 Regional patterns: access to water and basic needs poverty

As table 5.2.5 shows, some of the poorest regions are also those with the lower percentage of households using improved water sources/with water within 15 minutes from the home in the dry season. Lindi, Shinyanga, Pwani and Mara all have low use of improved water figures and high numbers of the population living beneath the poverty line. Kilimanjaro, Dar, Mbeya and Morogoro all have fewer households below the poverty line and have higher percentages of households that use improved water sources. There are, however, some surprises like Tabora (very low use of improved water but apparently one of the regions with a low percentage of those beneath the poverty line) and Singida - the opposite to Tabora. This needs further exploration.

TABLE 5.2.5 Percentage of households using improved water sources for drinking, living within 15 minutes of their drinking water source in the dry season and households beneath the basic needs poverty line

	% of households using improved water sources		% of households with water within 15 minutes		%of households below the basic needs of poverty
Lindi	19.8	**Mtwara**	44.1	**Singida**	49.4
Tabora	24.6	**Mara**	51.1	**Lindi**	43.1
Kagera	31.2	**Shinyanga**	53.3	**Mara**	36.3
Pwani	34.6	**Tanga**	53.7	**Mwanza**	35.6
Shinyanga	39.9	**Kagera**	53.8	**Shinyanga**	34.1
Mara	40.1	**Mwanza**	55.0	**Pwani**	33.5
Tanga	45.5	**Tabora**	60.1	**Kigoma**	30.6
Mtwara	52.3	**Kilimanjaro**	61.8	**Arusha**	29.4
Mwanza	52.8	**Arusha**	65.8	**Ruvuma**	28.1
Ruvuma	53.1	**Pwani**	67.3	**Tanga**	27.9
Iringa	53.8	**Lindi**	67.3	**Rukwa**	27.6
Rukwa	54.5	**Singida**	68.4	**Mtwara**	27.0
Arusha	58.8	**Rukwa**	69.7	**Dodoma**	25.8
Singida	60.7	**Morogoro**	70.7	**Iringa**	25.0
Dodoma	65.4	**Dodoma**	71.3	**Kilimanjaro**	23.6
Morogoro	70.2	**Kigoma**	72.5	**Kagera**	21.7
Mbeya	74.5	**Iringa**	77.1	**Morogoro**	21.4
Kigoma	75.8	**Mbeya**	77.5	**Tabora**	18.2
Kilimanjaro	77.2	**Ruvuma**	88.3	**Mbeya**	16.3
Dar es Salaam	93.3	**Dar es Salaam**	89.7	**Dar es Salaam**	11.9

5.3 Water and education

The proportion of school aged children who are either in school or who have finished their primary education was analysed for households living close to and far away from a water source. The DHS 1996 data was used. 62 % of school aged children who lived 15 minutes or less from their drinking water source were attending school (according to the DHS 1996), compared to 38% of school aged children who were not. Of those children living over one hour from their source of drinking water, the figure for children not in school rose to 50%, with the other 50% not attending school (DHS 1996).

School aged children were taken as those aged 7-18 years to allow for the late starting of many children in the education system in Tanzania. The DHS 1996 was used for this analysis as it was the most recent survey that gave the level of information required to carry out this analysis. As the surveys were not carried out in order to perform this analysis (that is the sampling strategy was not based around school aged children), the results must as pointers for future research.

FIGURE 5.3a Proportion of school aged children (7-18) who live 15 minutes or less from their drinking water source that are either in school or have completed primary school

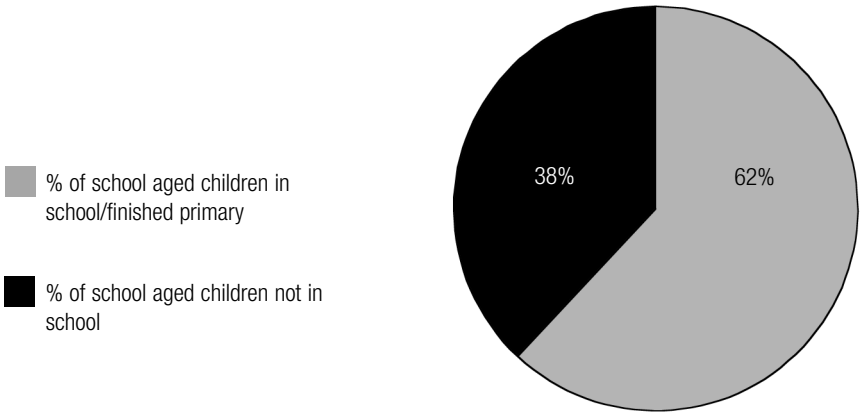
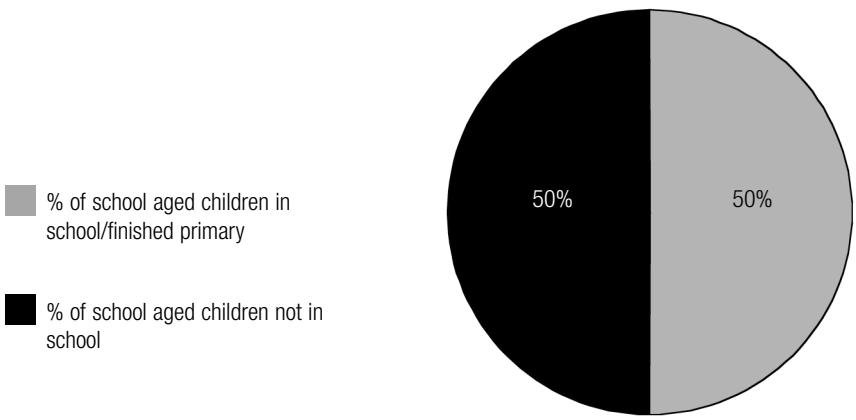


FIGURE 5.3b Proportion of school aged children (7-18) who live over 1 hour from their drinking water source that are either in school or have completed primary school (DHS)



Disaggregating by gender shows that there is little difference in the percentage of girls attending school or having completed primary school from the percentage of all children living both close and far from water sources.

Proportion of school aged girls (7-18 year olds) who live 15 minutes or less from their drinking water source that are either in school or have finished primary school

% of school aged girls in school/finished primary	58.8
% of school aged girls not in school	41.2

Proportion of school aged girls (7-18 year olds) who live more than an hour from their drinking water source that are either in school or have finished primary school

% of school aged girls in school/finished primary	50.8
% of school aged girls not in school	49.2

The reasons for these trends are complex. For example, proximity to a water source may also be closely related to proximity to the school. This should be explored further through more participatory and qualitative research.

Some policy implications of the findings 6.0

The following initial thoughts on policy implications of the findings will be expanded and refined as the water and sanitation stakeholders take forward this and other research. WaterAid's newly formed Policy Research and Dissemination Programme in partnership with the Ministry of Water is likely to take the initial lead in this.

6.1 Water and sanitation as priority sector for poverty reduction

6.1.1 The state of water and sanitation in Tanzania.

According to the surveys, in 2000/1, 46% of the total population of Tanzania still do not use an improved water source; 54% in rural areas. And, these figures do not reflect the unreliability, inaccessibility and fluctuating costs of many sources. The percentage of households with access to piped water has not increased significantly over the past 24 years although in absolute terms the number of people reached is higher and surveys do indicate an increased use of improved water sources in most areas through the 1990s. The percentage of households taking over 2 hours to fetch water is increasing. This suggests intensifying pressure on water points - and that investment in water supply development has not kept up with demand.

Although limited analysis was possible and cause-effect relationships are difficult to determine due to many confounding factors, the study suggests that school aged children taking less time to fetch water are more likely to attend school and that poor households are more likely to use unprotected water sources and travel longer distances in doing so, adding the likelihood of water-related diseases and a heavy burden of fetching water to other stresses faced by those living in poverty.

6.1.2 Prioritising the sector

The need for continued prioritisation of water (and environmental sanitation) and increased and effectively targeted and spent budget allocations is clear. Yet current budget allocations to both the ministry and local government authorities do not reflect the importance or the state of the sector. Compared to other priority social service sectors, water's allocation of the domestic and total budgets are low and not increasing at the same rate (MoF, 2002). Other research (referred to below) needs to review existing information or design new research to explore further the impact that investing heavily in water and sanitation would have on poverty reduction for all in Tanzania.

6.2 Water and sanitation targets for poverty reduction

6.2.1 Geographical inequalities in water and sanitation

The disparity between urban and rural households in the survey data is large. Rural water supply development is prioritised in the PRS but not reflected in the accompanying medium term expenditure framework (eg MoWLD 2001). The regional, and of course, district budget allocations and expenditures need to redress the clear regional disparities in sector service provision. Further analysis of public expenditure reviews for the sector is required.

6.2.2 Dar es Salaam: pro poor planning?

The situation in Dar es Salaam as depicted by the surveys is getting worse in terms of use of improved water sources and toilet facilities. However, the figures do remain very high; far higher than WaterAid and others' experience on the

ground suggests. The use of piped supply by poorer households is falling faster than for those above the poverty baseline. The PRS to date and attainment of HIPC completion point has demanded progress on privatisation of DAWASA. Is this really a pro-poor strategy? This needs further exploration.

6.2.3 Pro-poor targets for the PRS?

Is the poverty reduction strategy intended to increase the percentages of all households using improved water sources? Or is it intended to ensure that those most vulnerable to water insecurity or those living in extreme poverty gain better access to improve their well-being?

For example, one of the PRS targets set by MoWLD is the 'rehabilitation of all malfunctioning water sources' (originally targeted instead of, rather than as well as, the development of new water supplies). This target is clearly based on a need but is also a strategy designed to increase the number of households using improved supplies with minimal capital investment (MoWLD, personal communication). Targeting the poor would involve more significant investment in water supply development, a greater focus on areas where there is water scarcity and capacity building of communities and other actors to manage and maintain the schemes.

6.3 Quality data and information for Poverty Monitoring

6.3.1 Data quality and consistency.

The need for improved and, in some cases, more useful information on water and sanitation for informing pro-poor policy, budgeting and planning is clear. Survey questions not being comparable or useful and then misclassification of some key data limited the scope of this study. The need to clarify and be consistent with definitions of indicators, for example use of improved water sources, for all forms of data collection is evident.

6.3.2 Which data source to use?

Some 50% (HBS) OR 46% (MoWLD figures) of rural households use improved water sources - different figures dependent on the data used. Does it matter? Given the differences in measurement, the difference between the figures is actually very small. What appears to be important is a decision about which data source to use when monitoring key policy targets - which source provides good quality data, measures useful indicators and most effectively reflects the real situation faced by poor women, children and men in their everyday lives.

Poverty monitoring for the Sector: recommended modifications based on the survey results

7.0

7.1 Making recommendations

The stakeholder meeting in September acknowledged a huge range of possible water and sanitation indicators. These recommendations are based on this range plus findings of the study.

As described by Bosch et al (2001- draft), indicator types can be broken down into:

- *impact* indicators that measure the final effects of water and sanitation interventions on different poverty dimensions (eg reduced infant mortality from diarrhoeal disease, attendance and attainment at school, household income poverty levels).
- *outcome* indicators that measure the conditions required for the effects to be achieved
- *input/output indicators* that for water and sanitation include investment or expenditure on water at different levels and measures of the services provided (eg availability of spare parts).

The main focus of these recommendations is on outcome indicators. It was recognised by all participants that different indicators are required to generate information for different uses and require measurement by different components of the Poverty Monitoring System (section 1.2). These recommendations focus on those outcome indicators measured by surveys and census, linking where possible with routine data collection to enable more effective comparison and cross-checking.

In making recommendations, the importance of the following was recognised:

- linking indicators to national targets (and international goals) that are useful for decision making;
- maintaining consistency with previous surveys for trend analysis;
- working within space limitations of the surveys;
- working within the survey focus (eg health, household income and expenditure, labour) of the national surveys;
- keeping indicators few and simple, easy to measure and easy to translate into Swahili;
- relating to the basic information requirements that could and should be fulfilled by surveys to gather information required for monitoring outcomes of water and sanitation developments.

For water supply, for example, key information to monitor includes:

- quantity of water used in relation to that required for basic requirements (drinking, hygiene, cooking etc);
- quality of water for drinking
- accessibility of water source (accessibility in terms of physical access often restricted by terrain and distance, ability to pay the costs)
- reliability of water source (functioning of source every day all year round)

7.2 The recommendations

Table 7.1 below shows the indicators that this study recommends for measurement by the national household surveys. It highlights the existing indicators that the recommendations are based on and which survey should measure them. As the existing outcome indicators largely relate to the current national poverty reduction targets of increased and ultimately universal access, the link between recommended indicators and national targets is not stated.

The following pages outline each of the indicators in more detail. We then review the suggested disaggregation/target group to focus on for monitoring.

TABLE 7.1 The recommended indicators

ASPECT OF WATER & SANITATION	PREVIOUS INDICATOR (AND SOURCE)	MEASURED TO DATE?	RECOMMENDED INDICATORS	MEASURED BY
Water quality	Population/percentage of households with access to safe drinking water (PRSP & PWMI), Use of safe drinking water (TSED)	✔ HBS using improved sources	**Use of improved water sources for drinking** Use of (a) piped supply, (b) protected source, (c) unprotected source, (d) other	HBS, DHS Census Agricultural Plus RDS
Water quantity	Percentage of households with access to adequate supplies of water within 400m (PWMI)		**Time taken to fetch water (go, wait, collect and return)** (As proxy for water consumption and for waiting/pressure on services and for distance)	HBS DHS Census Agricultural
Water accessibility	Percentage of households with access to safe drinking water within 400m As above but 'adequate supplies' water' within 400m (PWMI)			
Water reliability	No indicator	Partly in HBS (dry season)	**Use of improved source as reserve during times of water insecurity** (supply break-down or during dry season)	HBS DHS Plus RDS?
Other - management of water supply	No indicator	Partly in HBS and DHS	Use of (a) water supply in home (b) water supply managed by community, (c) water supply managed by private individual or company	HBS, DHS Census Agricultural
Other - Livelihoods directly dependent on water	No indicator		Number of people working as water vendors	Labour Force Survey
Other - Expenditure in Relation to Affordability	Percentage of population contributing to water services (PWMI)	✔ but some mis-classified	**Household expenditure on water as proportion of total expenditure** Number of people dependent on service provided by water vendors	HBS HBS, DHS Census
Excreta disposal	Percentage of households with (i) toilet facility (ii) access to toilet facility Percentage of urban households with (i)access to sewage systems (ii) cesspool emptying (PWMI)	✔	**Use of improved toilet facilities** **Use of toilet facilities (a) connected to sewage system and (b) with cesspit that is emptied**	HBS, DHS Census Agricultural Plus RDS for health
Solid waste disposal	Percentage of urban households with access to garbage disposal facilities (PWMI)	✔ but not useful options	**Use of more hygienic waste disposal methods**	HBS DHS
Hygiene	None		**Households washing their hands with water and soap or ash after using the latrine**	DHS plus RDS

Households using improved drinking water source as main source

Use/importance:

Gives estimation of relative safeness of water sources used as well as some measure of quality with its health implications. Replaces 'use of safe water' as indicator.

Action required:

1. Final consensus regarding the classification for ALL types of sources and a clear definition of this classification in any training, survey manuals, reports.
2. Maintain basic DHS 99, HBS 00, Census 02 survey design. Allow for increased use of vendors/other types of source that need classifying where possible. Could expand on 'piped' to allow classification of relative safeness of supply source.
3. Routine Data Systems (Local Government Monitoring Database and water sector information systems) to adopt.

Sub-indicators allowed by question format:

1. Households using (a) piped supply, (b) protected source, (c) unprotected source and (d) other as main drinking water source.
2. Households dependent on water vendors for water supply
3. Households with private water point in home or plot
4. Households using community managed supply / privately managed supply

Measuring the indicator

Q **(i) What is the main source of drinking water used by household?**

Piped ❑

Protected well ❑
Protected/covered spring ❑

Unprotected well ❑
Unprotected spring ❑
Surface source (lake/dam/river/stream/pond) ❑

Covered rainwater catchment ❑
Uncovered rainwater catchment ❑
Water vendor ❑

Tanker truck ❑
Bottled water ❑
Other (please specify) .....

*If **piped** where does the water come from?*

Protected well/borehole ❑
Protected spring ❑
Treated surface source ❑
Unprotected (and untreated) source ❑
Don't know ❑

optional

if water vendor or tanker truck where does the water come from?

Piped or protected source ❑
Unprotected source ❑
Don't know ❑

(ii) Where is the source/who manages it?

Into own house ❑
Into own yard/plot ❑
Into neighbours' house/yard/plot ❑
Water point managed by community ❑
Water point managed by private company/individual ❑

Notes on comparability

1. Consistent with HBS, DHS and Census since 1978 for piped, wells, springs, surface, rain & other
2. Consistent with HBS 1991 & 2000/1 collapsed groups for piped, protected, unprotected, other.

NB in classification, the analyst would have the option of either (a) adding *water vendors known to be collecting from piped or protected source*, *tanker truck from piped or protected source* and *bottled water* into the improved/safe water category (recommended) OR (b) leaving them as other.

3. Consistent with DHS 1999 which broadened categories used in previous DHS and with the Census 2002 water vendors response option.

Households taking 30 minutes or less to fetch water (to reach the source, collect water and return home)

Use/importance:

To more accurately estimate the time spent fetching water and gain indication of the pressure on water service points and the likely level of water consumption.

Note on selection of 30 minutes: Cairncross and Feacham (1993) and DFID, 1988 quote observations that indicate a return travel time of 5 minutes or less is necessary for increased water consumption. An estimated 30 minutes is a generous return journey time (including collecting time) most people could take using a water source 400 metres away or less (as per National Water Policy; MoWLD, 2001). The long-term aim should be to reduce this indicator to 5 minutes in the future.

Action required:

1. Consensus that this should be measured in addition if necessary to households within 400m (although we believe 400m to be very difficult to monitor by surveys and routine data systems - how many VEOs measure this?)
2. DHS question wording to be adopted for other surveys. Requires adding question to HBS.

Q: How long does it take you to fetch water from the main drinking water source (to go, wait, collect water and return)?

..... minutes

Notes on comparability

This is the existing DHS question with no change.

To put this into the HBS requires this question to be added immediately after the question on main water source used NOT with the other time and distances to facilities as these ask for time and distance to go only to the dry season source not the main source.

Measuring the 400m

If it is vital that 400m is measured for the National Water Policy, the coding for the HBS should be altered to allow this to be recorded (the lowest distance current coded in the HBS 2000/1 is less than 1km'). NOTE: This will relate to drinking water source in the dry season only.

Combination Indicator
Households using improved main water source for drinking that takes 30 minutes or less to fetch water from (go, wait, collect and return).

Households using improved drinking water source and/or taking 30 minutes or less to fetch water in times of water insecurity

Use:

To indicate household situation in times of water insecurity allowing for different types of water insecurity, the most common being during dry season and when supply breaks down.

Action required:

Water source question repeated for alternative (or reserve) source. Note that this translates as

Q: What alternative source does your household use for drinking?
Give same response options as above

Q: When does your household use these sources?
When main source dries up ❑
When main source breaks down ❑
During times of low household income ❑
Other - specify .....

Q: How long does it take to fetch water from this alternative source (to go, wait, collect water and return)?
.....minutes

Note on comparability

This is an additional question for the DHS.
For the HBS, the distance and time to water in the dry season question could be either

(i) modified to include waiting time (note comparability with 91 and 00/1 would then be lost) OR
(ii) an additional line for *how long does it take to wait and collect water (not including journey time)* could be added which would allow the journey time multiplied by 2, plus the waiting/collecting time to be added for an estimated total fetching time.

Proportion of household expenditure budget spent on water

Use:

To track changes in household expenditure on water and the financial implications for households of burden on certain households

Action required:

Correctly and logically classify so that different types of expenditure on water recorded in the household diary can be monitored. This could be simply a water code that includes ALL expenditure on water for domestic use. It could also be a 'water' category with the following sub groups

- Water from water vendors
- Contributions to water fund
- Water bill
- Costs of improving water sources/ Other

We imagine that it would have to be merged as most people just write 'water'. The data indicates that that classified as 'water bills' also includes contributions and some vendors.

Households using improved toilet facilities

Households using toilet facilities (a) connected to sewage system and (b) with cesspit that is emptied

Use:

To indicate more hygienic methods of excreta disposal rather than just whether a household has or uses a toilet facility.

Changes needed:

Expand on the 'latrine' response option without losing the main classification (flush, pit, none) to include improvements - slab, stabilised pit, vent pipe.
Addition of waste disposal question (cesspit or sewerage)
Amendments made to relevant RDS - eg MTUHA Health Information System

Q: (i) What toilet facility does your household use?

Flush toilet	❑
Pit latrine (traditional or improved)	❑
No facility/bush/field	❑
Other - specify	❑

Q: (ii) if a pit latrine, what improvements have been made to the latrine? (can tick more than one)

None	❑
Lined/stabilised pit	❑
Cement slab	❑
Vent pipe	❑
Durable shelter	❑

Q: (iii) how is the waste stored and then disposed of?

Connected to sewerage system	❑
Septic Tank/Cesspit that can be emptied (by tanker/pump)	❑
Septic Tank/Cesspit that cannot be emptied (collapsed/not accessible)	❑
Pit that is emptied (by tanker/pump/by hand when decomposed)	❑
Pit that is filled in when full	❑
Pit that is abandoned when full as not possible to empty or fill	❑
Other	
Don't know	❑

Q: (vi) Does your household own that facility? .....
Yes/no

Notes on comparability

Q (i) is directly comparable with the HBS, DHS and Census surveys used in the study (when VIP and Latrines are merged).
The others are additions not alterations and allow a far more useful analysis.

Households with hand-washing facilities for latrine

Use:
Indication of hygiene knowledge and practice

Action required:
This is a new question. Add to DHS only that currently lacks any measure of hygiene knowledge, attitudes and practice

Q: Does your latrine have:

Water for handwashing	❑
Water and soap for handwashing	❑
Water and ash/equivalent for handwashing	❑
No handwashing facilities	❑

Households disposing of rubbish by burying/burning/collection

Uses:
Environmental sanitation

Action required:
Modify existing HBS question to add more useful response options
Could be added to DHS questionnaire

Q: What does your household do with rubbish?

Thrown outside and left	❑
Thrown outside and burnt	❑
Stored for collection to communal dump	❑
Stored and taken to communal dump	❑
Put in pit and left	❑
Put in pit and burned	❑
Put in pit and covered	❑

Notes on comparability
This should be comparable with the current HBS survey response options of *thrown away*, *bin*, *pit* which as they stand are not very useful.

7.3 Indicators for informing poverty eradication strategies - whose access?

By disaggregating the data measured for the above indicators using the suggestions below, more targeted planning for poverty reduction/eradication strategies could be achieved.

Suggested levels of disaggregation for more targeted planning

Rural, Urban and Dar households
The disparities between rural and urban areas and between Dar es Salaam and other areas demonstrate the need to disaggregate by these strata wherever possible. At least a rural-urban disaggregation should always be applied. This should help focus attention on rural water supplies that lag behind urban.

Regions (and where possible) districts

Householdsin the richest and poorest expenditure quintiles (or households above and below the poverty line)
Can we rely on benefits of investment in water and sanitation to effectively 'trickle down' to poor households in poor areas or should we focus our attention on key households and geographical areas, those most vulnerable to water insecurity and poor environmental sanitation?
Are we planning for improved coverage figures or to improve the lives and livelihoods of those with the poorest access to water and sanitation facilities?

As a measure of inequalities in rich and poor, expenditure quintiles could be used as a measure of the two extreme income poverty bands.

Large households or those with a high dependency rate

Female headed households

Householdsin that are geographically remote from the decision makers at village and district level
Although HBS results did not show that female-headed households are worse off in terms of access to improved water, DHS results indicated that their situation may be worsening. Both show an increased number of female-headed households in the country over the 1990s. Gender disaggregation should be carried out.

The HBS 2000/1 dependency ratios were not available from the NBS in time for this study and the data on the number of infants and children in the household was problematic. However, the poverty analysis and many other studies suggest that large households are poorer (NBS and OPML, 2000). Also, the results from the study do suggest that households headed by the elderly are less likely to use improved water sources. Looking to the future, with the increasingly evident effects of HIV/AIDS on family structures, dependency ratios are likely to rise. It is therefore very important to monitor the access to water and sanitation of such groups.

7.4 Taking it forward: possible research priorities

7.4.1 Surveys and census

EASTC students can pilot the recommended questions before any modifications made to the questions for inclusion in the forthcoming agricultural (2003) and demographic and health surveys (2004).

Results from the Census 2002 should be incorporated into this study (when datasets are cleaned and completely ready for use - learning from our experiences this time!) to allow a District level analysis of households using improved water sources and using a toilet facility.

7.4.2 Routine Data Systems

Survey indicators and data collection questions and response options need to be synchronised - where appropriate and feasible - with routine data systems. Trials have been suggested with the Local Government Reform Monitoring Database through WaterAid and UAPP's work in Singida Urban.

7.4.3 Qualitative research

The surveys clearly do not and cannot ever fulfil all the information requirements of the sector for informing anti-poverty strategies in Tanzania, even if coupled with comprehensive routine data systems producing quality data.

The voices of poor people in Tanzania need to reach decision makers through other means that link micro level experiences to macro (and meso in the context of decentralisation) policy, plans and budgets. These need to address WHY the observed trends are occurring so that barriers to universal access to water and sanitation can be identified and more effective strategies to remove them designed. Possible areas for further research are:

- *Who are the water poor?* Maintaining the household as a unit, are elderly headed households, households remote from the village (and perhaps District) centre, those with high dependency ratios the 'water poor'? Does participatory research support the survey indication that female headed households are not worse off? What about intra-household inequalities between men and women, children and adults, elderly and younger, less able and more able, children/family of the head of household and others? Do we need to conceptualise 'water poverty' and its manifestations?
- *Water and education* exploring further the links between school attendance and proximity to water, for example.
- Water and income poverty what are the linkages?

7.4.4 Taking on the challenges as a coalition

The study was carried out by a working team in consultation with key water and sanitation stakeholders from Ministries, UN agencies, Civil Society and research institutions in Tanzania. Early on this 'advisory team' agreed that this study was just the beginning of longer-term and broader joint work on these and other sector development issues. We look forward to further and increased co-ordination and collaboration.

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Household Budget Survey 2000/1- from National Bureau of Statistics, Dar es Salaam

Appendices

(Numbering relates to section in report)

1.2.1 Data and information flow through the water and sanitation sector from community level to the national poverty monitoring system - with indicator use and databases in existence marked

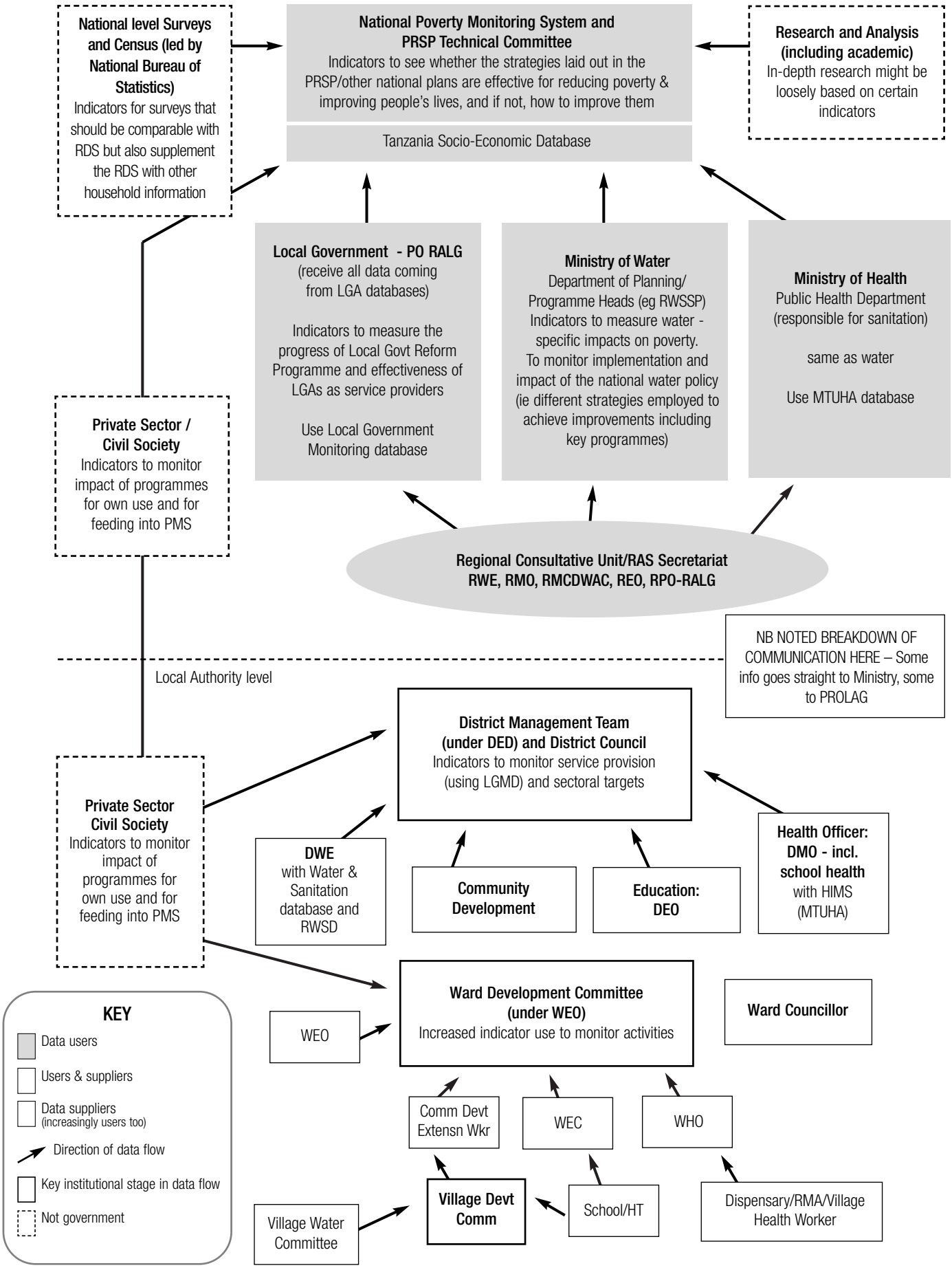
1.3.1 Indicators for Water and Sanitation and their measurement (or non-measurement) by the routine data and survey data collection systems as reviewed by the Stakeholder Workshop, 14th September, Ubungo Maji, Dar es Salaam.

2.1.1 Surveys used in study and their relevant variables for analysis

2.1.2 Water and environmental sanitation indicators measurable by the surveys

3.2.2 Government budget speeches' figures for water coverage

APPENDIX 1.2.1. Data and information flow through the water and sanitation sector from comunity level to the national level poverty monitoring system - with indicator use and databases in existence marked



APPENDIX 1.3.1. Indicators for Water and Sanitation and their measurement (or non-measurement) by Routine and Survey data collection systems as reviewed by Stakeholder Workshop, 14.09.01 Ubungo Maji, DSM

		DATA COLLECTION SOURCE								Recommendations for measurement
Source of indicator	**INDICATOR** (with source of indicator in bracket and poverty welfare and monitoring indicators highlighted)	**Local Govt Monit'g Database** (Mar 02)	**Sector RDS***	**Census**			**Surveys**			
				Measure?	Frequency	Disagg.	**HBS/DHS**	Frequency	Disagg.	
PRSP	ACCESS TO WATER **Population with access to safe water**	✔ but safe sources not clear	'Coverage' figures generated by Ministry	✔	1978 1988 (2002)	National to Village	✔ HBS ✔ DHS	**HBS**: 91/2, 01 **DHS:** 1999	HBS: Regional, rur/Dar/urban DHS: rur/urban	Include agreed classfication system for safe water and inclusion in LGMD and watsan sector RDS
	Hhlds/Pop with access to piped supply/ protected wells/ protected springs as main source of drinking water		'Coverage' figures generated by Ministry	Piped only ✔	1978 1988 (2002)	National to village	✔ HBS ✔ DHS - 'piped' in all but protected in 99 only	**HBS**: 91/2, o1 **DHS**: 1999	HBS: Regional, rur/Dar/urban DHS: rur/urban	Include use of different sources in LGRP and watsan sector RDS
	Hhlds/ Population with access to unprotected well, unprotected spring, surface sources as main source of drinking water		'Coverage' figures generated by Ministry				✔ DHS - 'surface source' in all but protected wells etc in 99 only	**HBS**: 91/2, o1 **DHS**: 1999	HBS: Regional, rur/Dar/urban DHS: rur/urban	Include use of different sources in LGRP and watsan sector RDS
PWMI	**Hhlds/Pop with access to (safe) drinking water** supply within 400m						HBS records within 1km in dry season	**HBS**: 91/2, o1	HBS: Regional, rur/Dar/urban	Modify survey to measure it
LGMD (Sept 01)	Average distance to drinking water source						HBS (kms) in dry season	**HBS**: 91/2, o1	HBS: Regional, rur/Dar/urban	Include in watsan sector RDS
	Hhlds/pop with water supply point within house or plot.						✔ piped only HBS, Well & piped in DHS 92-6 but not comparable with HBS	**HBS**: 91/2, o1 **DHS**: 1992,94 96	HBS: Regional, rur/Dar/urban DHS: rur/urban	Include in watsan sector RDS
	Households/ Population with access to drinking water supply within X no minutes						✔ HBS one way only	**HBS**: 2001 only	HBS: Regional, rur/Dar/urban	Modify survey
	Average time spent fetching water						✔ **DHS**	**DHS**: 1992,94 96, 99	DHS: rur/urban	Preferably include in watsan sector RDS and specific research
	Access to non-drinking domestic water supply within certain distance/time						✔ **DHS**: 1992 only	✔ DHS 1992 only	Rural/urban	Could include in household survey. Include in watsan sector RDS.

*** Note:** only MoH's MTUHA was nationally operational in Sept. 01. The MoWLD's Rural Supply Database is still under construction and Water and Sanitation Database is operational in 3 districts only.

APPENDIX 1.3.1. Indicators for Water and Sanitation and their measurement (or non-measurement) by Routine and Survey data collection systems as reviewed by Stakeholder Workshop, 14.09.01 Ubungo Maji, DSM

		DATA COLLECTION SOURCE								Recommendations for measurement
	INDICATOR	LGRP	Sector RDS*	Census			Surveys			
				Measure?	Frequency	Disagg.	HBS/DHS	Frequency	Disagg.	
	School children with access to clean and relatively safe water source within school grounds									In Education RDS – EMIS. In LGRP and/or watsan RDS
	Health clinic/hospital with clean and relatively safe water source within grounds									In Health RDS – HMIS/MTUHA In LGMD/other RDS
	Households where a) women, b) girl children, c)boy children, d) men, e)elderly…are collecting water									Preferably include in watsan sector RDS and surveys
	Households collecting water by: a) foot, b) bicycle, c) hand pulled trolley, d) animal-pulled cart, e)motor vehicle, f) other									Preferably include in watsan sector RDS and surveys
	Households storing drinking water in a) open bucket, b) open water jar/pot, c)water jar/pot with lid, d)bottle, e)other									Preferably include in watsan sector RDS and surveys
	Households a) filtering, b)boiling, c)chemically purifying d) other method, e)not treating drinking water									Preferably include in watsan sector RDS and surveys
	ACCESS TO ENVIR SANITATION Households with a toilet facility/ Households with access to a toilet facility			✔	1978 1988 (2002)	National to village	✔ HBS DHS	**HBS** 91/2, 01, **DHS** 1992, 94, 96	HBS: Regionl, rur/Dar/urban DHS: rur/urban	Include in watsan and/or health sector RDS
	Households/Population with access to flush toilet (from data)			✔	1978 1988 (2002)	National to village	✔ HBS DHS	**HBS** 91/2, 01, **DHS** 92-9	HBS: Regionl, rur/Dar/urban DHS: rur/urban	Include in watsan and/or health sector RDS
	Households/Population with access to VIP latrine (from data)			✔	1978 1988 (2002)	National to village	✔ HBS DHS	**HBS** 91/2, 01, **DHS** 92-9	HBS: Regionl, rur/Dar/urban DHS: rur/urban	Include in watsan and/or health sector RDS
	Households/Population with access to traditional pit latrine (from data)			✔	1978 1988 (2002)	National to village	✔ HBS DHS	**HBS** 91/2, 01, **DHS** : 92-9	HBS: Regionl, rur/Dar/urban DHS: rur/urban	Include in watsan and/or health sector RDS
	Households/Population using field/bush/no toilet facilities (from data)			✔	1978 1988 (2002)	National to village	✔ HBS DHS	**HBS** 91/2, 01, **DHS** 92-9	HBS: Regionl, rur/Dar/urban DHS: rur/urban	Include in watsan and/or health sector RDS
	Households/population using 'other' toilet facilities (from data)			✔	1978 1988 (2002)	National to village	✔ HBS DHS	**HBS** 91/2, 01, **DHS** 92-9	HBS: Regionl, rur/Dar/urban DHS: rur/urban	Include in watsan and/or health sector RDS
	Households using shared toilet facilities (from data)						✔DHS (TRCHS)	**DHS** 1992, 94, 96	HBS: Regionl, rur/Dar/urban DHS: rur/urban	Include in watsan and/or health sector RDS

*** Note:** only MoH's MTUHA was nationally operational in Sept. 01. The MoWLD's Rural Supply Database is still under construction and Water and Sanitation Database is operational in 3 districts only.

APPENDIX 1.3.1. Indicators for Water and Sanitation and their measurement (or non-measurement) by Routine and Survey data collection systems as reviewed by Stakeholder Workshop, 14.09.01 Ubungo Maji, DSM

		DATA COLLECTION SOURCE								Recommendations for measurement
	INDICATOR	**LGRP**	**Sector RDS***	**Census**			**Surveys**			
				Measure?	Frequency	Disagg.	**HBS/DHS**	Frequency	Disagg.	
PWMI	**Percentage of urban hhlds with access to sewage systems**									Include in watsan RDS and surveys.
	Households with septic tank		✔ Health	✔ Health						Watsan RDS/ survey
	Households with piped sewage system		✔ Health	✔ Health						Watsan RDS/ survey
	Households with other sewage system		✔ Health							Watsan RDS/ survey
PWMI	**Percentage of urban hhlds with access to cesspool (or septic tank) emptying**									Include in watsan RDS and LGMD as District level service.
PWMI	**Percentage of urban households with access to (waste) disposal facility**									Include in watsan RDS and LGMD as District level service
	Households with access to an improved toilet facility with handwashing facilities									Watsan RDS/ survey
	Schools with access to an improved toilet facility (with handwashing facilities)									Include in watsan & education RDS
	Clinics/hospitals with access to improved toilet facility (with handwashing facilities)									Watsan/health RDS
	Percentage of hholds with access to garbage disposal facilities (PWMI – urban specific)							✔ HBS but response options not good	**HBS:** 91/2, 01	Future census and watsan sector RDS
	Households/Population disposing of rubbish by throwing it outside							✔ HBS	**HBS**: 91/2, 01	Future census and watsan sector RDS
	Households/Population disposing of rubbish in bins							✔ HBS	**HBS**: 91/2, 01	Future census and watsan sector RDS
	Households disposing rubbish by burning									Future census and watsan sector RDS
	Households whose rubbish is collected by solid waste management system (eg truck)									Future census and watsan sector RDS
	HEALTH Incidence of diarrhoeal disease for under 5s							✔ TRCHS 2 week recall	**DHS**: 1992, 94, 96, 99	
	Incidence of diarrhoeal disease for all							✔ HBS 4 week recall	**HBS**: 91/2, 01,	
	Incidence of other water/san related disease: trachoma									
	Incidence of other water/san related disease: cholera									

*** Note:** only MoH's MTUHA was nationally operational in Sept. 01. The MoWLD's Rural Supply Database is still under construction and Water and Sanitation Database is operational in 3 districts only.

APPENDIX 1.3.1. Indicators for Water and Sanitation and their measurement (or non-measurement) by Routine and Survey data collection systems as reviewed by Stakeholder Workshop, 14.09.01 Ubungo Maji, DSM

		DATA COLLECTION SOURCE								Recommendations for measurement
SOURCE OF INDICATOR	**INDICATOR**	**LGRP**	**Sector RDS***	**Census**			**Surveys**			
				Measure?	Frequency	Disagg.	**HBS/DHS**	Frequency	Disagg.	
	WATER AND SANITATION SERVICE PROVISION/MANAGEMENT **% of council's own funds used to construct and repair water systems (LGRP)**	✔								LGRP and watsan RDS
	% of population contributing to water services (PWMIs)	✔ ?								LGRP and watsan RDS
	No. of villages with village accounts (LGRP)	✔ ?								LGRP and watsan RDS
	No. of villages with bank accounts for water funds									LGRP and watsan RDS
	No. of villages operating savings and credit schemes or revolving funds with water and sanitation accounts									LGRP and watsan RDS
	Amount in village water fund	✔ ?								LGRP and watsan RDS
	Village water fund income for water fund over year									LGRP and watsan RDS
	Village expenditure from water fund over year									LGRP and watsan RDS
	Amount contributed to water fund per month/other time period									LGRP and watsan RDS
	Amount paid per 20 litres of water									LGRP and watsan RDS
	No. of households exempt from paying for water/contributing to fund due to eg poverty levels									LGRP and watsan RDS
	% of households paying the water fund contribution									LGRP and watsan RDS
	% of rural water committee members who are women	✔ ?								LGRP and watsan RDS
	No. of people per public water supply point (beneficiaries not collectors)	✔ ?								LGRP and watsan RDS
	No. of functioning sources a) All year round b) Wet season only									LGRP and watsan RDS
	No. of operating hours of water source									LGRP and watsan RDS
	No. of private connections in village/street (household use)									LGRP and watsan RDS
	No. of private connections in village/street for water vending									LGRP and watsan RDS
	Indicator about state of privatisation in the District (to be developed)									LGRP and watsan RDS
	Availability of spares/tools/services within village and within district									LGRP and watsan RDS

*** Note:** only MoH's MTUHA was nationally operational in Sept. 01. The MoWLD's Rural Supply Database is still under construction and Water and Sanitation Database is operational in 3 districts only.

APPENDIX 2.1.1. Surveys used in study and the relevent variables for analysis

HOUSEHOLD BUDGET SURVEY

1991

Carried out: 1991

Focus: Includes: measuring living conditions of private households in Tz and benchmark poverty data

Format: Household survey with: 1) household questionnaire (household demographic and social characteristics, housing conditions, last year's purchase of large consumer durables, asset ownership and sources and receipts of annual income in past year), 2) daily diary of every income and expenditure, in cash or kind.

Sample: National, rural/dar/other urban
Based on National Master Sample (222 enum areas) which give reasonably reliable estimates for rural areas, Dar and other urban areas. 24 households per EA, stratified into 3 income groups. Total sample therefore 5328 households. Poverty Baseline (2000) used 4823 of these that are clean

Comments: Not huge survey but as been analysed for the poverty baseline, the data is clean, indexes have been generated and should be straightforward to use.

Held: NBS. Easily accessible.

2000/1

Carried out: 2000/1

Focus: Social, Demographic and Economic features of the household. Key survey as used to provide quantitative measures of income poverty as well as the poverty baseline for the mainland PRS.

Format: Household survey with: 1) household questionnaire carried out by interviewer, 2) month long diary filled in by household members

Sample: National, rural/Dares Salaam/other urban, and regional disaggregation.
Covered 20 mainland regions. Approx 22,000 households. Scale reduced due to financial and capacity constraints - rural clusters cut.

Comments: NPMMP identifies HBS as secondary data source for core PRSP 'access to water' indicator (census main source). Very useful survey for water and sanitation as has distance as well as source indicators, together with other key poverty indicators. Some scope for minor improvements (given lack of space in national surveys for any particular sector) in coding, in inclusion of more water specific expenditure recording, and in classification of sanitation facilities (notably more urban sewage and garbage disposal).

Held: NBS

WATSAN	OTHER POVERTY RELATED VARIABLES FOR	CROSS-TABULATION DISAGGREGATION POSSIBLE
WATER **Main drinking water supply** (summarised in Pov Baseline - need to check actual survey for details) • Private piped water in housing unit • Private piped water outside housing unit • Piped water on neighbours' housing unit (Note: 2000/1 only) • Piped water on community supply • Rain catchment tank • Public well (protected) • Public well (un-protected) • Private well (protected) • Private well (un-protected) • Spring (protected) • Spring (not protected) • River, dam, lake etc • Other **Nearest water supply in the dry season (drinking water)** • Distance in kms (<1km coded 000) • Time in hours and minutes (Note: 2000/1 only) Amount spent on water in month Purchase of water as household expenditure item recorded as water bill but water vendor purchases mis-classified as 'bottled drinks and ice cream'! **SANITATION** **Toilet facility (for household)** • No toilet • Flush • Pit latrine • Ventilated Improved Pit latrine • Other (specify) **Disposal of garbage** • Rubbish pit in compound • Rubbish pit outside compound • Rubbish bin • Thrown inside compound • Thrown outside compound • Other (specify) **Hygiene** Within (section 5) purchase of durable items & other services during past 12 months like toilet soap but difficult to pick up.	**DEMOGRAPHIC** • Sex and age of head of household • Household size • Relationship of household members to head of household • Marital status **HEALTH** • Diarrhoea incidence for all household members in past 4 weeks • Time off work/school due to illness **EDUCATION** **(per child) Attendance:** • Currently in school? • Why not currently in school? (too old/completed, too far, too expensive, is working at home/job, useless/uninteresting, illness/pregnancy, failed exam, got married, other) - not water or domestic work specifically • Current grade attending (pre-school, standard I to VII, course after primary, Form I-IV, course after IV, Form V-VII, course, diploma, other certificate, university degree, adult education)? **Attainment:** • Highest grade completed (as current grade options) **Literacy:** • can read and write in English, Swahili, both, other, can't? **Main/secondary economic activities** Not in enough detail to pick out water related. **Poverty index** (in relation to poverty lines of Food Poverty and Basic Needs Poverty) • headcount ratio (incidence) • poverty gap measure (depth of poverty indicates relative deprivation) **Household expenditure per capita** Can use expenditure quintiles **Housing particulars** • size of house/building materials/tenure issues	**GEOGRAPHICAL** Mainland only Mainland: rural, urban, Dar. Regional. **DEMOGRAPHIC** **By gender** **By age** • under 25, 25-39, 40-59, 60+ • all children (under 18) • School aged children (taken as 7-13 or 7-18 to pick up all those in Primary Ed) **By household heads** • Women headed households • Elderly headed households (60+) **By key vulnerable group** (to be identified): • Widows/divorced women • Elderly • Young children **By size of household**

Demographic and Health Survey

1996 (same variables as 1992 and 1994 though not different samples)

Carried out: 1996 (July-Nov)

Focus: Fertility, Family planning, infant and child mortality, maternal and child health and nutrition, AIDS, female circumcision.

Format: Household survey with: 1) household questionnaire, 2) women's questionnaire and 3) men's questionnaire

Sample: National, rural/urban and mainland/Zanzibar (and Unguja/Pemba) disaggregation. Also disaggregated by zones: coastal, Northern highlands, Lake, Central, Southern Highland, Southern
Women's questionnaire gives whole country, urban/rural and zonal estimates, with some regional disaggregation. Men's survey gives urban-rural and whole country estimates.

Sample design: Based on 1991/2 sample - 357 EA s, 262 rural, 95 urban. Wards/branches selected, then EA s within, households listed then selected. Households selected on contiguity (proximity) beginning with randomly selected start number (practical difficulties of scattered houses).

Sample size: 7969 households interviewed (8900 sample, 8141 occupied). 8120 women interviewed (8501 selected aged 15-49); 2256 men interviewed (2658 selected aged 15-59).

Sample error checks revealed some under reporting and displacing of respondent - eg making children over 5 so not included in infant health section or making women 50 rather than 49. Water data not got workload implications so might be more accurate (not discussed).

Complex to assess standard error of sample as not a random sampling method. Generally, small relative standard error for most estimates.

Comments: Can use household and individual women's questionnaires as the household information is repeated in their one

Classification of water sources used in report:
Relatively safe: piped, springs, rainwater
Less safe: wells, rivers/streams/ponds/lakes/gravity (?)
NOT CONSISTENT IN WRITE UP IN USE OF THE TERMS
(eg wells talked of as unsafe then safe)

Time taken to fetch analysed as <15mins and then median time (to give weight to extremes)

Held: NBS but also Macro-International website who have helpline for queries.

WATSAN	OTHER POVERTY RELATED VARIABLES FOR	CROSS-TABULATION DISAGGREGATION POSSIBLE
WATER **Main source of drinking water for members of the household** Piped water • Piped water into house/yard/plot • Piped to Public/private tap Well water • Well in residence/yard/plot • Public/private well Surface water • Spring • River/stream • Pond/lake • Dam Rainwater Other (specify) Length of time taken to go there, get water and come back • In minutes • On premises **SANITATION** **What toilet facility does household have?** Flush • Own flush toilet • Shared flush toilet Pit • Traditional pit toilet • Ventilated Improved Pit latrine No facility/bush/field Other (specify)	**DEMOGRAPHIC** • Sex and age of head of household • Number living in household • Relationship of household members to head of household • Parental survivorship of children • Marital status **HEALTH** **Diarrhoeal incidence** • Incidence of diarrhoea in last 2 weeks for children under 5 (last, next to last born and 2nd to last born) • Care when sick: less/same/more offered to drink and eat • Treatment of (drink/food/medicine/advice) • Mother's illness with stomach problems during last 2 weeks **EDUCATION** **(per child): Attendance:** • Ever attended school • If under 25, still in school? **Attainment:** • Highest formal school completed (<1yr, StI-VII, Form I-VI, Uni, other) **Literacy:** • In kiswahili/newspaper readership Main reason for stopping school • Pregnancy/marriage • Young children to care/family needed work assistance • Couldn't pay fees/needed to earn • Graduated • Bad grades • Didn't like • Too far/inaccessible • No space or opportunity • Other **Income poverty variables** Consumer goods (per household) • Electricity/Radio/TV/Fridge • Bicycle/Motorcycle/Car • No rooms to sleep in house/main mat of floor • Food security (family have enough to eat) • Land ownership **Other: Work** • Working (other than house work) • Work for self/others • Type of work • Who decides how money spent	**GEOGRAPHICAL** Mainland, Zanzibar Mainland: urban, rural, 6 zones Zanzibar: Unguja, Pemba (NB part of coastal zone) **Demographic** Sex Age (given in years) Possible classifications: *By gender* *By age* • 'Eligible' women (aged 15-49) • 'Eligible' men (aged 15-59) • all children (under 18) • children under 15 • youths (15 to 25??) • School aged children *Household heads* • Women headed households • Child headed households • Elderly headed households (define elderly: 49/59?)

Tanzania Reproductive and Child Health Survey - DHS 1999

1999

Carried out: 1999

Focus: Broad maternal and child health including fertility levels and preferences, family planning use, childhood morbidity, knowledge and behaviour re HIV/AIDS

Format: Household survey with: 1) household questionnaire, 2) women's questionnaire and 3) men's questionnaire

Sample: National, rural/urban and mainland/Zanzibar disaggregation. Total of 176 census enumeration areas selected - over sampling of urban areas and Zanzibar. Based on DHS 1996 sample. 3615 households interviewed (3826 sample) - 1192 urban and 2423 rural. 4029 women interviewed (of 4118 aged 15-49); 3542 men interviewed (of 3792 aged 15-59).

Comments: Not a huge survey

Held: NBS and Macro-International.

WATSAN	OTHER	DISAGGREGATION
WATER **Main source of drinking water for members of the household** • Piped water into dwelling • Piped into yard/plot • Piped to Public tap • Water from open/ unprotected well • Protected dug well • Borehole/tubewell • Protected spring • Unprotected spring • Pond/river/stream • Rainwater • Tanker truck • Bottled • Other **Length of time taken to go there, get water and come back** • In minutes • On premises **SANITATION** Toilet facility used by most members of the household • Flush • Traditional pit toilet • Ventilated Improved Pit latrine • No facility/bush/field • Other (specify) **If toilet facility shared with other households**	**DEMOGRAPHIC** • Sex and age of head of household • Number living in household • Relationship of household members to head of household **HEALTH** **Diarrhoeal incidence** • Incidence of diarrhoea in last 2 weeks for children under 5 (last & next to last born) • Care when sick: less/same/more offered to drink and eat • ORS use • Need for medical advice **EDUCATION** **(per child): Attendance:** • Ever attended school • Currently attending • Attended at all current school year • Attended at all previous sch year • Standard/form attended that year **Attainment:** • Highest standard/form completed **Income poverty variables** Consumer goods (per household) • Electricity • Radio • TV • Fridge • Bicycle • Motorcycle • Car/truck **Other: Child Labour** • If children regularly help with household chores like cleaning, caring for animals, cooking • Hours spent per day on chores	**GEOGRAPHICAL** Mainland, Zanzibar Mainland: urban, rural Zanzibar: Unguja, Pemba **DEMOGRAPHIC** Sex Age (given in years) Possible classifications: *By gender* *By age* • 'Eligible' women (aged 15-49) • 'Eligible' men (aged 15-59) • all children (under 18) • young children (under 5) • children under 15 • youths (15 to 25??) • School aged children (often taken as 7-15, could be 5-15 with nursery, could be 5-c22 given age of finishing secondary) *Household heads* • Women headed households • Child headed households • Elderly headed households (define elderly: 49/59?)

Population and Housing Census

Census 1988

Carried out: 1988

Focus: Enumeration of population and basic housing conditions, with a particular focus on economic activity, migration, fertility, mortality and housing conditions.

Format: 2 questionnaires - basic and detailed

Sample design: Entire population covered with basic questionnaire (number in household, relationships of members, sex, age, citizenship). Longer questionnaire administered to sample of households.

Single stage sampling with EA s created from maps and lists done 1986-8. 800 people per EA in rural areas, 400 per EA in urban. Size of sample then determined by number of EA s in District - 30-50 selected per D in Rural Areas, 50 EA s per urban District. Systematically Simple Random Sampling method.

Sample: National to household level disaggregation for population data, to District level for more detailed questionnaire results.

Assessed error: Measurement greatest error. Sampling error judged to be fairly small.

Comments: Highly disaggregated. Identified by NPMMP as main source of data for PRSP access to safe water

Held: NBS. Easily accessible.

NOTE: REPORT ONLY USED IN ANALYSIS AND DISAGGREGATED BY RURAL-URBAN ONLY DUE TO VARIABLES POSSIBLE FOR ANALYSIS

WATSAN	OTHER	DISAGGREGATION
WATER **Question unknown** - classification: • Piped water within • Piped water outside • Well water within • Well water outside • Other supply within • Other supply outside • Not stated **SANITATION** Question unknown • Flush toilet inside • Flush toilet outside - shared • Pit latrine • None • Not stated NB appear in analytical report disagreggated by: Zanzibar, Mainland, total, rural, urban, all by TENURE of the house	**DEMOGRAPHIC** • Sex and age of head of hhld/ others • Household size • Relationship of hhld members to head • Marital status • Citizenship • Survival of mother **EDUCATION** **(per child): Attendance:** • Now attending • Completed • Never attended **Attainment:** • Highest level of education completed (pre-primary, primary I-VIII, secondary I-VII, university/related, training after primary, training after secondary **Literacy:** • Read & write in Swahili. **Economic Activity** Ec status **Housing conditions** • Facilities and tenure	**GEOGRAPHICAL** Mainland, Zanzibar Regional By District By Division/ward/village/hhld* * for basic demog data. Detailed q'naire possible only to District level. Urban, Rural (urban-rural within District?) **DEMOGRAPHIC** *Gender* *Age*

Census 2002

For information only as not used in analysis

Carried out: 2002

Focus: Enumeration of population and basic housing conditions

Format: Entire population covered with basic questionnaire (number in household, relationships of members, sex, age, disability, citizenship, marital status). Longer questionnaire administered to sample of households (covering 25% of population)

Sample: National to household level disaggregation for population data, to District level (assumed) for more detailed questionnaire results.

Comments: Highly disaggregated. Identified by NPMMP as main source of data for PRSP access to safe water

Held: NBS. Easily accessible.

WATSAN	OTHER	DISAGGREGATION
WATER **Main source of drinking water for members of the household** • Piped water • Protected well • Unprotected well • Protected spring • Unprotected spring • River/stream • Pond • Lake • Rainwater • Lambo • Water vendors • Others **SANITATION** Toilet facility used by household • Flush • Traditional pit toilet • Ventilated Improved Pit toilet • No facility • Other	**DEMOGRAPHIC** • Sex and age of head of hhld/ others • Household size • Relationship of hhld members to head • Marital status • Disability • Citizenship • Survival of parents **EDUCATION** **(per child): Attendance:** • Now attending • Completed • Never attended **Attainment:** • Highest level of education completed (pre-primary, primary I-VIII, secondary I-VII, university/related, training after primary, training after secondary **Literacy:** • read & write in Swahili, English, both, other language, can't. **Economic Activity** • Done in last 12 months • Done in last 7 days (options include paid/non paid full time/seasonal, contributing family worker. Also occupation and industry) **Housing conditions** • Building materials • Number of rooms for sleeping • Main source of energy for cooking/lighting **Consumer goods (per household)** • Radio • Phone • Bicycle • Hoe • Wheelbarrow • Charcoal iron • Electric iron	**GEOGRAPHICAL** Mainland, Zanzibar Regional By District By Division/ward/village/hhld* • for basic demog data. Detailed q'naire possible only to District level. Check. Urban, Rural **DEMOGRAPHIC** **As other surveys and as 'other' allows**

APPENDIX 2.1.2. WATER INDICATORS measurable by main surveys

INDICATOR SOURCE	INDICATOR (and notes on survey measurement)	HBS 1976 report	Census 1978 report	Census 1988 report	HBS 1991/2 data	DHS 1991/2 data	DHS 1994 data	DHS 1996 data	DHS (TRCHS) 1999 data	HBS 2000/1 data	Census 2002
PRSP IDT PWMI (see below)	**USE OF PROTECTED WATER SOURCES FOR DRINKING** Population with access to safe water *As recognised in PWMIs, this is only possible if you use 'population using protected or improved source' – piped, protected wells, covered springs. Surveys measure this by households not population.*				✔				✔	✔	✔
	Households with access to piped/ wells/ springs/ rainwater/ surface/ other as main source of drinking water	✔ not surface/ spring	✔ piped & wells only	✔ piped & wells only	✔	✔	✔	✔	✔	✔	✔
PWMI	**DISTANCE TO DRINKING WATER SOURCES/TIME SPENT FETCHING WATER** Households with access to safe drinking water supply within a certain distance *States 400 m in PWMI but not possible in any of surveys due to coding used*	✔ water within 1Km			✔ water within 1Km					✔ water within 1Km	
(proposed LGME)	Average distance to drinking water source	✔			✔			✔		✔	
(proposed LGME)	Households/population with water supply point within house or plot	✔			✔			✔	✔	✔	
	Households with access to drinking water supply within X number of minutes					✔ minutes taken to go, collect, return	✔ minutes taken to go, collect, return	✔ minutes taken to go, collect, return	✔ minutes taken to go, collect, return	✔ to go only	
	Average time spent fetching water					✔ as above	✔ as above	✔ as above	✔ as above	✔ as above	
	EXPENDITURE ON WATER Percentage of households paying water bill Percentage of monthly household expenditure spent on water bills									✔ ✔	

Key to Surveys: HBS = Household Budget Survey, **DHS** = Demographic and Health Survey (**TRCHS** is Tanzania Reproductive & Child Health Survey.
Key to Indicator Sources: PRSP = Poverty Reduction Strategy Paper (2000), **PWMI** = Poverty and Welfare Monitoring Indicators (VPO, 1999) **IDT** = International Development Target indicator. **LGME** = proposed local government monitoring & evaluation indicator.
These are not all included in these tables, only those measurable by surveys to show overlap.

APPENDIX 2.1.2. ENVIRONMENTAL SANITATION INDICATORS measurable by main surveys

INDICATOR SOURCE	INDICATOR (and notes on survey measurement)	HBS 1976 report	Census 1978 report	Census 1988 report	HBS 1991/2 data	DHS 1991/2 data	DHS 1994 data	DHS 1996 data	DHS (TRCHS) 1999 data	HBS 2000/1 data	Census 2002
PWMI	**USE/OWNERSHIP OF TOILET FACILITIES** Households with (i) their own toilet facility (ii) access to a communal toilet facility	 ✔ ✔				only for flush	only for flush	only for flush			
	Households/Population using flush toilet/latrine/no toilet/other *Surveys differ on ownership and use of.*	✔	✔	✔	✔	✔ ownership not use	✔ ownership not use	✔ ownership not use	✔ used by most members of hhold	✔	✔
PWMI urban specific	**GARBAGE DISPOSAL** Percentage of households with access to garbage disposal facilities *HBS 76 covers how garbage is disposed of after collected from house. Others cover methods of disposal at household level (bin/pit/thrown).*	? not comparable with other HBSs			? not comparable with 2000/1. Useful data?					✔ comparable with 1991 but useful data?	
	Households/Population disposing of rubbish by throwing it outside	✔			✔					✔	
	Households/Population disposing of rubbish in bins	✔			✔					✔	
	EXPENDITURE ON SANITATION/HYGIENE Household expenditure on toilet soap/ paper/ cleaning materials				 ✔					 ✔	

OTHER POVERTY AND WELFARE MONITORING INDICATORS NOT MEASURED IN SURVEYS
(for interest – the publication for PWMIs states that routine data is the most important source for most of them)

- **Percentage of households with access to adequate supplies of water within 400m**
  As stated in table, no survey measures 400m. No survey measures whether supplies are 'adequate'
- **Percentage of population contributing to water services.**
  Not measured except as water bill.
- **Percentage of urban households with access to (I) sewage system (ii) cesspool emptying**
  Not measured.

APPENDIX 2.1.2. Population with clean water ('coverage') as declared by Minister in budget speech

YEAR OF SPEECH	NATIONAL	CHANGE	RURAL	CHANGE	URBAN	CHANGE
1986	45.5%					
1987						
1988						
1989						
1990			44.8%			
1991						
1992	48.5%		42.9%			
1993						
1994						
1995						
1996			48%		67%	
1997					68% use piped	
1998						
1999		2.8%			68%	7%
2000			50%		68%	
2001			50%		70%	

1986 Figure calculated from population absolutes given. Recognises ability of Ministry to reach the remaining 14.28 people (as predicted will be by 1991) is small.

1987 Reports inability to reach target of clean water for all by 1991, extending target to 2002. Announces that water services are no longer free.

1988 Telling Parliament that water services are no longer given free in towns and villages. Donor support as 1990

1989 NO DOCUMENT AVAILABLE

1990 National aim is for all Tanzanians to get clean water within 400m by 2002. If all schemes were working, 47.5% would get water.

1991 NO DOCUMENT AVAILABLE

1992 Actual figure of coverage is lower as 50 % of schemes not working reliably - (haitoi huduma ipasavyo)...given these figures is not going to be easy to give water to all in rural and urban areas by 2002.

1993 NO DOCUMENT AVAILABLE

1994 NO DOCUMENT AVAILABLE

1995 Progress of water policy, creation of UWSAs, water accounts, number of wells rehabilitated.

1996 Rural areas 48 % get clean water. 30% of schemes not working. Urban areas 67% get clean and safe water not enough water sources to cope with in-migration. Urban sewerage use about 20% in Dodoma, Arusha, Mbeya, Tabora, Mwanza, Moshi, Tanga

1997 Campaign 'Agenda for Water' - Maji ni Uhai na Maji kwa Wote ifikapo mwaka 2002. Numbers of rural people without water services is high and the number who have service falling as schemes breaking down. Urban 68% covered by piped

1998

1999

2000

2001 Refers to Vision 2025 aim to eradicate poverty by 2025.

References

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Jamhuri ya Muungana wa Tanzania (2000), *Hotuba ya Waziri wa Maji* Mhe Alhaj Mussa S K Nkhangaa (Mb) akiwasilisha katika Bunge Makadirio ya Matumizi ya Fedha ya Wizara ya Maji kwa Mwaka 2000/1

Jamhuri ya Muungana wa Tanzania (1999), *Hotuba ya Waziri wa Maji* Mhe Alhaj Mussa S K Nkhangaa (Mb) akiwasilisha katika Bunge Makadirio ya Matumizi ya Fedha ya Wizara ya Maji kwa Mwaka 1999/2000

Jamhuri ya Muungana wa Tanzania (1998), *Hotuba ya Waziri wa Maji* Mhe Balozi Dk Pius Y Ng'wandu (Mb) akiwasilisha katika Bunge Makadirio ya Matumizi ya Fedha ya Wizara ya Maji kwa Mwaka 1998/1999

Jamhuri ya Muungana wa Tanzania (1997), *Hotuba ya Waziri wa Maji* Mhe Balozi Dk Pius Y Ng'wandu (Mb) akiwasilisha katika Bunge Makadirio ya Matumizi ya Fedha ya Wizara ya Maji kwa Mwaka 1997/1998

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Jamhuri ya Muungana wa Tanzania (1992), *Hotuba ya Waziri wa Maji*, Nishati na Madini, Mhe Luteni Kanali Jakaya Mrisho Kikwete (Mb) akiwasilisha katika Bunge Makadirio ya Matumizi ya Fedha ya Wizara kwa Mwaka 1992/1993

Jamhuri ya Muungana wa Tanzania (1991), *Hotuba ya Waziri wa Maji*, Nishati na Madini, Mhe Meja Jakaya Mrisho Kikwete (Mb) akiwasilisha katika Bunge Makadirio ya Matumizi ya Fedha ya Wizara kwa Mwaka 1991/1992

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United Republic of Tanzania (1987), *Statement of the Minister of Water*, Hon Dr Pius Y Ng'wandu (MP) made during the presentation of the National Assesmbly of Estimate of Expenditure for the Minstry of Water for the Year 1998/8

Jamhuri ya Muungana wa Tanzania (1986), *Hotuba ya Waziri wa Ardhi, Maji, Nyumba na Maendeleo Mijini*, Ndugu Dk Pius Y Ng'wandu (Mb) akiwasilisha katika Bunge Makadirio ya Matumizi ya Fedha kwa Mwaka 1986/87.

Notes

- 1992 references a 20 year evaluation (p6)
- 2000 JICA and Germany in Kagera and Kigoma
- 1988 and 1990 talks about donor support by region: Denmark Iringa, Mbeya, Ruvuma; Dutch Marogoro and Shinyanga; Finland Mtwara and Lindi; Lutheran World Fed Singida
- 1986 donor: Sweden lake region, Norway Kigoma and Rukwa, plus other above and UNICEF (Mtwara), LWF Singida, Christian Council of Tz Sgd, Cth Relief Service, UNICEF and FAO Shinyanga
- 2000 WaterAid gets a mention in thanks - for work in Dodoma and Mtwara ! 2001 WaterAid and Oxfam mentioned