Water and Sanitation in Tanzania

Poverty Monitoring for the sector using the HBS, the DHS and the population censuses

Extracts from the main report

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
Using the Household Budget Survey, the Demographic and Health Survey and population censuses to measure trends in water and sanitation


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 survey 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.

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 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 (Figure 1).

FIGURE 1. Percentage of Households using piped water as their main drinking source over time
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 (Figure 2). 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 (up 3%) and protected sources (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

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**FIGURE 2.** Change in use of piped protected, unprotected and other water sources for drinking 1991–2001 from HBS
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 (DHS), 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 (Figure 3). 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.

**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.
FIGURE 3. Change in time taken to go, collect water and return 1992-99

FIGURE 4. Percentage of rural households using improved (piped and protected) water sources as their main drinking water source by region (source: HBS 2000/1)
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 (see Table 2). 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.

<table>
<thead>
<tr>
<th></th>
<th>HBS 2000 Households</th>
<th>Routine 2000 (MoWLD) Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>88%</td>
<td>70%</td>
</tr>
<tr>
<td>Rural</td>
<td>46%</td>
<td>50%</td>
</tr>
<tr>
<td>Lindi (rural)</td>
<td>11%</td>
<td>34%</td>
</tr>
<tr>
<td>Kilimanjaro (rural)</td>
<td>74%</td>
<td>48%</td>
</tr>
</tbody>
</table>

**TABLE 2. Comparison of improved water supply coverage results**

**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.

**FIGURE 5. Change in use of improved water sources for drinking by gender**

![Graph showing change in use of improved water sources for drinking by gender]
**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 and 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 in 2000 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
### TABLE 3. The recommended indicators

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

See main report for in-depth discussion of indicators especially those for sanitation and solid waste disposal.
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The main report is available from the Directorate of Policy and Planning at the Ministry of Water and Livestock Development and WaterAid Tanzania

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