

# Will Malawi meet the MDGS targets for water and sanitation at district level? evidence from the 2008 national census

## Abstract

Malawi is striving to meet the Millennium Development Goals (MDGs) on water and sanitation by 2015. Most Malawi reporting has focused on MDGs attainment at national level and not at district level. MDGs targets can be met at national level and be missed at district level. This paper will assess MDGs water (74%) and sanitation targets (86%) attainment at district levels assessing whether the MDGs targets were met in all 28 districts. The paper used the 2008 Malawi Census 28 districts dataset. The results indicate that while Malawi met the MDGs targets on access to water and basic sanitation at national level, some districts missed the MDGs targets on water (74%) and sanitation (86%). All cities (Blantyre, Lilongwe, Mzuzu and Zomba) met the Malawi MDGs targets for access to potable water and basic sanitation. However, 12 out of 28 districts missed the MDGs target on basic sanitation. These are Mzimba and Karonga in the North; NkhotaKota, Lilongwe, Salima and Mchinji in the Centre and Neno, Machinga, Mwanza, Phalombe, Chikwawa and Nsanje in the South. The access to potable water MDGs target was missed by Rumphu, Chitipa, Nkhatabay and Likoma in the North; Nkhatakota, Ntchisi, Dedza, Mchinji, Lilongwe, Kasungu and Dowa in the Centre and Neno, Machinga and Thyolo in the South. These results indicate to policy makers that a country can meet the MDGs targets at national level and yet miss the same targets at district level. The results are instructive in that policy makers should not formulate interventions based on national targets but district level target results.

**Keywords:** potable water, sanitation, piped water, boreholes, shallow wells, MDGs, Malawi

Volume 9 Issue 1 - 2019

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**Received:** October 28, 2018 | **Published:** January 02, 2019

## Introduction

### Overview of the water and sanitation sector in Malawi

Malawi is one of Sub-Saharan Africa's most densely populated countries with about 15 million people spread over land area of 94,276 km<sup>2</sup>, giving a population density of 139 persons/km<sup>2</sup>.<sup>1</sup> The country is endowed with a variety of natural resources which include large surface water bodies covering about 21% of the country's territorial area. These include Lake Malawi (28,750 km<sup>2</sup>) Africa's third largest freshwater lake and 10th largest in the world; Lake Malombe (303 km<sup>2</sup>) and Lake Chilwa (683 km<sup>2</sup>). More than ten major rivers drain into Lake Malawi. There are also widespread groundwater sources whose occurrences are associated with basement complex and alluvial aquifers. The Total Renewable Water Resource (TRWR) in the country is estimated at 17.3 km<sup>3</sup>/year or 1,617 m<sup>3</sup>/capita/year.<sup>2</sup> While the availability of water resources in Malawi in the aggregate is considered satisfactory, per capita water availability is declining at a rapid rate due to population growth, and Malawi may start to experience water stress after 2025.<sup>2</sup> Good sanitation in urban and rural areas is required to ensure proper disposal of excreta and proper handling of solid and liquid wastes. Good sanitation is the ability to dispose of human wastes in a healthy, ecologically sound and safe manner. Proper hygienic practices are also required for good health and involve practices such as hand washing after visiting the toilet and cleaning of fruits and vegetables before eating. Most water-borne and water-related diseases such as cholera can easily and effectively be prevented through access to clean water, good sanitation and hygiene

practices such as hand washing and proper disposal of liquid and solid waste including human excreta.

### National frameworks and policies for water and sanitation sector

The water and sanitation sector is governed by a number international, national and sectoral policies and regulatory frameworks. The major guiding policy frameworks for Malawi are the Malawi Growth and Development Strategy,<sup>3</sup> the UN Millennium Development Goals (MDGs), the National Water Policy<sup>4</sup> and Sanitation Policy.<sup>5</sup> The Malawi remains committed to align its programmes to facilitate the achievement of the MDGs goals and targets. The goals and targets are important as they reflect improvements in the wealth and welfare of the people of Malawi. One of MDGs is to ensure environmental sustainability (Goal 7), and some of its targets are to;

- I. Increase the percentage of population with sustainable access to improved water source to 74% by 2015 (Target 10)
- II. Increase the percentage of households with access to improved sanitation to 86% by 2015 (Target 11) (GoM, 2005).

In Malawi, MDGs are actualized through the Malawi Growth and Development Strategy (MGDS II) (MGDS, 2011). The MGDS II (2011-2016) is the overarching operational medium-term strategy for GoM that provides the country's socioeconomic growth and development priorities. The MGDS recognizes that strong and sustainable economic growth is key to reducing poverty. It ranks

irrigation and water development as the second most important priority area after agriculture and food security. The provision of clean water and sanitation services is among the top government priorities as a main development priority considering that many common diseases are associated with unsafe water. The Government of Malawi (GoM) is committed to improving sustainable access to water supply and sanitation in urban, peri-urban and rural areas by establishing water supply and sanitation systems using demand responsive and demand driven approaches.<sup>2</sup> Results from Malawi population census of 2008 indicate that 74 percent of Malawi's population has access to potable water.<sup>1</sup> It is projected to increase to 91% in 2015, more than the MDG target of 74% for Malawi. The proportion of households with access to basic sanitation facilities was estimated at 94% as of 2008 while access to improved sanitation is at 46%.<sup>5</sup> Despite the encouraging picture, sustainable access to improved water and sanitation services remains questionable in rural districts and in particular rural towns and market centres. This is mainly due to inadequate service coverage to meet the increasing population, poor quality of surface and ground water, inadequate promotion of hygiene and sanitation, and negative impact of climate change and lack of mitigation measures for water-related disasters.<sup>6</sup>

The GoM developed the National Sanitation Policy (NSP) in 2008 order to provide a framework for the development of programmes and initiatives to address sanitation and hygiene challenges facing Malawi. The mission of the NSP is to ensure that all people in Malawi own and have access to improved sanitation facilities, practice safe hygiene, and practice safe recycling of liquid and solid waste for sustainable environmental management and socio-economic development (NSP, 2008). Some of the major guiding principles for the NSP include; sanitation as a basic right, gender inclusion, recycling and re-use of solid waste, and stakeholder participation. The overall policy goal is to promote improved sanitation and safe hygiene practices for improved health and socio-economic development for the people of Malawi. It aims at improving universal access to improve sanitation and safe hygiene practices. Access to water and sanitation give an indication of the level of economic development because it enables people to be healthier and lead a more economically and socially productive life.

### Paper objectives

Most Malawi reports and papers on access to potable water and improved sanitation have tended to focus on MDGs attainment at national and city levels without focusing on MDGs attainment in individual districts. Since it is possible to meet the MDGs targets at national level and miss it at district level, an assessment is required at the district level. This paper will focus on attainment of MDGs targets in individual Malawi districts and addresses the question whether each Malawi district will be able to meet the MDGs goals on access to water and basic sanitation. The paper will address household access to potable water and basic sanitation and will assess whether the MDGs targets on water and sanitation will be met at individual district level.

### Materials and methods

The authors used the 2008 Malawi Census comprehensive dataset on state of sanitation and sources of water by district and by urban and rural areas. The data set covered all 28 districts of Malawi and was obtained from the National Statistical Office from the 2008 Malawi Population Census.<sup>1</sup> During the 2008 Census, households were asked to indicate the main sources of water in the wet and dry season and types of sanitation facilities used by households. Since the census covered the whole country, this is the most current

comprehensive data set on access to potable water and sanitation in Malawi. The next population census is due in 2018. Access to safe water and sanitation is measured by the number of people (as a percentage) that have a reasonable means of getting an adequate amount of water that is safe for drinking, washing and essential household activities and the provision of facilities and services for the safe disposal of human liquid and solid waste.<sup>1</sup> The NSO dataset had number of households accessing water sources by type, sanitation facilities by type. Data was aggregated at national, regional and district levels. The number of households accessing water sources and sanitation facilities by type by district and region were expressed as a percentage using a mathematical formula in Excel. The analyses focused on characterising sources of water by type in both dry and wet seasons and on characterising sanitation facility by type. The sanitation facilities covered both improved and basic types. Further, the analyses addressed the key question on whether Malawi twenty-eight (28) districts will be able to meet the Malawi MDGs targets on access to potable water (74%) and basic sanitation (86%).<sup>3</sup> The results were presented in graphical and table formats.

## Results and discussions

### Household access to basic sanitation

**Access to sanitation by type:** Nationally, access to sanitation facilities is at 87 percent, with the urban areas having far much better access (98 percent) compared to the rural areas (85 percent). The main types of sanitation facilities reported during the Census were traditional pit toilet, flush toilet and VIP latrine. These fall in the category of basic sanitation facilities which refer to management of human faeces and urine at household level. The Census reported the highest number of flush toilets by comparison in the urban areas (15 percent in urban areas and 0.7 percent in rural areas). Traditional pit toilets are shown to be the main type of sanitation facility in the whole country (81 percent) and they are by far the most significant type of sanitation facility in both the rural (82 percent) and urban (79 percent) areas (Figure 1). While access to sanitation facilities in the urban areas is generally better than in the rural areas, there is still heavy reliance by urban population on the use of simple sanitation facilities as indicated by the heavy use of traditional pit toilets sometimes without a roof.

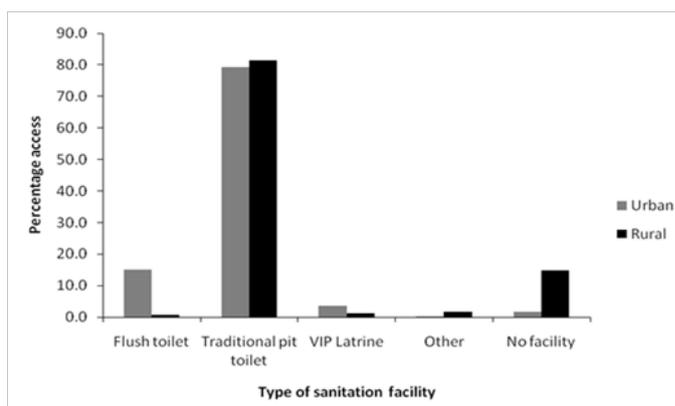


Figure 1 Access to basic sanitation.

### Trends in household basic sanitation (1998–2008)

Over the years, the steady increase in population growth has resulted in challenges towards improvement of access to sanitation facilities in most developing countries.<sup>7</sup> For Malawi however; there has been an improvement in access to facilities for human waste disposal, as was

also observed between the 1998 and 2008 Census. During this period the urban areas reported an improvement in access to sanitation from 97 percent to 98 percent, while the rural areas recorded a bigger jump from 75 percent to 85 percent. Comparison of the north, centre and southern regions of the country shows that all regions have more than 85 percent access to basic sanitation services. The rural areas in all the three regions reported percentage access of between 83 and 90 percent which shows significant improvements for the period between 1998 and 2008 as shown in Figure 2. The highest single increase between the census years was in traditional pit toilets (74 percent to 82 percent) in the rural areas. The urban areas reported a drop in use of flush toilet facilities from 18 percent to 15 percent during the same period. This drop may be attributed to increased population growth in the urban and peri-urban areas, due to rural to urban migration which may have put a strain on provision of water based sanitation facilities in the urban areas. Notable improvements in access to sanitation were reported in all the three regions with the north reporting an increase from 81 percent to 88 percent, the centre from 79 percent to 87 percent and the south from 79 percent to 87 percent. At district level, only Salima, Mchinji, Phalombe, Chikwawa and Nsanje reported access to basic sanitation facilities below 80 percent.

### Access to basic sanitation and MDG Goal on sanitation

The UN Millennium Development Goals include a target to increasing access to basic sanitation by the year 2015 and in this regard the target for Malawi is 86 percent. Table 1 shows the percentage access

to basic sanitation for all the districts in the country. As it can be seen, all the metropolitan areas (Blantyre, Lilongwe, Mzuzu and Zomba cities) met the Malawi target MDG for access to basic sanitation. At regional level, two out of six districts in the north did not meet the sanitation target (Mzimba, 84 percent and Karonga, 82 percent), while the numbers for the centre were four out of nine (NkhotaKota, 83 percent; Lilongwe, 82 percent; Salima, 79 percent and Mchinji, 78 percent) and for South it was six out of thirteen districts (Neno, 86 percent; Machinga, 85 percent; Mwanza, 83 percent; Phalombe, 79 percent; Chikwawa, 64 percent and Nsanje, 62 percent).

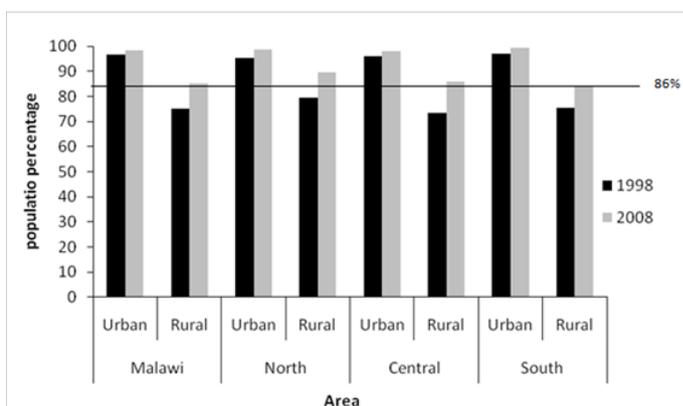


Figure 2 Access to basic sanitation by rural-urban in Malawi.

Table 1 Access to Basic Sanitation by district and by region

| Background characteristics | Type of toilet facility |              |                        |             |             |       | Access |
|----------------------------|-------------------------|--------------|------------------------|-------------|-------------|-------|--------|
|                            | Household Numbers       | Flush toilet | Traditional pit toilet | VIP Latrine | No facility | Other |        |
| Place of residence         |                         | %            | %                      | %           | %           | %     | %      |
| Malawi                     | 2869933                 | 2.9          | 81.1                   | 1.6         | 12.8        | 1.6   | 87.2   |
| Urban                      | 430828                  | 15.2         | 79.2                   | 3.7         | 1.7         | 0.3   | 98.3   |
| Rural                      | 2439105                 | 0.7          | 81.5                   | 1.3         | 14.7        | 1.8   | 85.3   |
| By Gender                  |                         |              |                        |             |             |       |        |
| Male                       | 2087181                 | 3.2          | 82.4                   | 1.8         | 11.3        | 1.4   | 88.7   |
| Female                     | 782752                  | 2.1          | 77.9                   | 1.3         | 16.7        | 2     | 83.3   |
| By District                |                         |              |                        |             |             |       |        |
| Northern Region            | 336602                  | 2.4          | 82.9                   | 2           | 11.6        | 1.1   | 88.4   |
| Mzuzu city                 | 27268                   | 16.1         | 80.4                   | 1.9         | 1.4         | 0.2   | 98.6   |
| Chitipa                    | 36708                   | 0.7          | 94.9                   | 1.3         | 2.1         | 1     | 97.9   |
| Rumphi                     | 35208                   | 1.7          | 91.5                   | 2           | 4.4         | 0.4   | 95.6   |
| Nkhatabay                  | 41054                   | 1.6          | 83                     | 3.1         | 10.3        | 1.9   | 89.7   |
| Likoma                     | 1968                    | 2.5          | 84.9                   | 1.8         | 10.8        | 0.1   | 89.2   |
| Mzimba                     | 138949                  | 0.7          | 81.1                   | 1.4         | 15.6        | 1.1   | 84.4   |
| Karonga                    | 55447                   | 2.2          | 75                     | 3           | 18.3        | 1.5   | 81.7   |
| Central Region             | 1192139                 | 2.9          | 81.3                   | 1.2         | 13          | 1.6   | 87     |
| Lilongwe city              | 147063                  | 15.3         | 80.3                   | 2.4         | 1.8         | 0.2   | 98.2   |

Table Continued....

| Background characteristics | Type of toilet facility |              |                        |             |             |       |        |
|----------------------------|-------------------------|--------------|------------------------|-------------|-------------|-------|--------|
|                            | Household Numbers       | Flush toilet | Traditional pit toilet | VIP Latrine | No facility | Other | Access |
| Place of residence         |                         | %            | %                      | %           | %           | %     | %      |
| Ntchisi                    | 46127                   | 0.7          | 90.9                   | 0.8         | 6.6         | 1     | 93.4   |
| Ntcheu                     | 110577                  | 0.6          | 89.4                   | 0.7         | 8.2         | 1.2   | 91.8   |
| Dedza                      | 142797                  | 0.7          | 87.1                   | 0.9         | 10.4        | 1     | 89.6   |
| Kasungu                    | 125902                  | 1.3          | 84.7                   | 1.1         | 11          | 1.8   | 89     |
| Dowa                       | 119011                  | 0.7          | 82.7                   | 1.6         | 12.9        | 2     | 87.1   |
| Nkhotakota                 | 61058                   | 6.3          | 72.8                   | 1.6         | 17.5        | 1.8   | 82.5   |
| Lilongwe                   | 269845                  | 0.5          | 79.3                   | 0.5         | 17.8        | 2     | 82.2   |
| Salima                     | 74569                   | 1.9          | 72.1                   | 1.7         | 21.4        | 2.9   | 78.6   |
| Mchinji                    | 95190                   | 0.8          | 72.8                   | 1.2         | 22.3        | 2.9   | 77.7   |
| Southern Region            | 1341192                 | 3            | 80.5                   | 2           | 12.9        | 1.7   | 87.1   |
| Blantyre city              | 146079                  | 15.9         | 79.2                   | 4.1         | 0.4         | 0.3   | 99.6   |
| Zomba city                 | 18408                   | 26.6         | 65.6                   | 7.2         | 0.6         | 0.1   | 99.4   |
| Chiradzulu                 | 68720                   | 0.8          | 90                     | 0.7         | 7.8         | 0.6   | 92.2   |
| Thyolo                     | 137277                  | 1.1          | 87.9                   | 1.7         | 8.4         | 0.8   | 91.6   |
| Mangochi                   | 178580                  | 1.1          | 88                     | 1.2         | 8.6         | 1     | 91.4   |
| Zomba                      | 138164                  | 0.7          | 87.1                   | 1           | 9.9         | 1.4   | 90.1   |
| Blantyre                   | 79347                   | 1.5          | 84                     | 1.6         | 11.4        | 1.6   | 88.6   |
| Balaka                     | 74195                   | 1.1          | 83.8                   | 1.8         | 11.8        | 1.5   | 88.2   |
| Mulanje                    | 122644                  | 0.9          | 83.6                   | 1.9         | 12.3        | 1.3   | 87.7   |
| Neno                       | 24570                   | 0.6          | 81.3                   | 2.4         | 14.4        | 1.3   | 85.6   |
| Machinga                   | 112196                  | 0.8          | 81.4                   | 1.5         | 15.2        | 1.1   | 84.8   |
| Mwanza                     | 21040                   | 1.7          | 79.3                   | 1.1         | 16.8        | 1     | 83.2   |
| Phalombe                   | 73486                   | 0.4          | 73.7                   | 1.6         | 20.8        | 3.5   | 79.2   |
| Chikwawa                   | 94981                   | 1.7          | 52.9                   | 3.4         | 35.9        | 6.2   | 64.1   |
| Nsanje                     | 51505                   | 0.8          | 55.3                   | 1.2         | 37.9        | 4.7   | 62.1   |

MDG Goal 7 for Basic Sanitation, Target 11 for Malawi 86 %

### Household access to potable water

During the 2008 Census sources of drinking water reported were;

- a. Piped water into the dwelling unit
- b. Piped water into the yard/plot
- c. Community stand pipe
- d. Borehole
- e. Protected well
- f. Unprotected well
- g. Spring
- h. River/stream
- i. Pond/lake
- j. Dam
- k. Rain water

- l. Tanker/bowser
- m. Bottles water or
- n. Some other source.

Safe water sources refers to piped water into the dwelling unit, piped into the yard/plot, community stand pipe, protected wells and boreholes (Table 2) & (Table 3). Information on sources of drinking water was collected for both the wet and the dry seasons. In the past Censuses, it was observed that access to water varies with season, whereby people generally had slightly higher access to water during the wet seasons, especially in the rural areas. The period between the 1998 and 2008 Censuses reported an increase in access to safe water sources throughout the year (i.e. for both wet and dry seasons) as indicated in Figure 4, Table 1 and Table 2. This may be attributed to the notable developmental schemes such as the Rural Piped Water Schemes<sup>3</sup> and an increase in number of boreholes drilled since 1994.<sup>8</sup> However, in terms of Malawi's MDG target, the central region had the greatest number of districts not meeting the national target of 74 percent for access to safe potable water for both wet and dry seasons.

**Table 2** MDG goal and access to potable water in the dry season by district

| Category         | District        | Safe water sources (%) | Unsafe water sources (%) |      |
|------------------|-----------------|------------------------|--------------------------|------|
| Country Location | Malawi          | 73.9                   | 26.1                     |      |
|                  | Urban           | 93.9                   | 6.2                      |      |
|                  | Rural           | 70.4                   | 29.7                     |      |
| By Gender        | Male            | 73.7                   | 26.3                     |      |
|                  | Female          | 74.3                   | 25.7                     |      |
| North            | Northern Region | 73.4                   | 26.6                     |      |
|                  | Mzuzu           | 90.6                   | 9.4                      |      |
|                  | Karonga         | 81.8                   | 18.2                     |      |
|                  | Likoma          | 74.3                   | 25.7                     |      |
|                  | Mzimba          | 74                     | 26.1                     |      |
|                  | Rumphi          | 73.4                   | 26.7                     |      |
|                  | Chitipa         | 64.5                   | 35.5                     |      |
|                  | Nkhatabay       | 56.4                   | 43.6                     |      |
|                  | Centre          | Central Region         | 68.1                     | 32   |
| Lilongwe city    |                 | 92.7                   | 7.3                      |      |
| Salima           |                 | 81.6                   | 18.5                     |      |
| Ntcheu           |                 | 76.8                   | 23.2                     |      |
| Nkhotakota       |                 | 68.2                   | 31.8                     |      |
| Ntchisi          |                 | 67.9                   | 32.1                     |      |
| Dedza            |                 | 65.9                   | 34.1                     |      |
| Mchinji          |                 | 64                     | 36.3                     |      |
| Lilongwe         |                 | 63.5                   | 36.5                     |      |
| Kasungu          |                 | 53.4                   | 47                       |      |
| Dowa             |                 | 52.9                   | 47.1                     |      |
| South            |                 | Southern Region        | 79.2                     | 20.8 |
|                  |                 | Zomba city             | 97.2                     | 2.8  |
|                  | Blantyre city   | 94                     | 6.2                      |      |
|                  | Chiradzulu      | 87.5                   | 12.5                     |      |
|                  | Phalombe        | 85.9                   | 14.1                     |      |
|                  | Balaka          | 83.4                   | 16.6                     |      |
|                  | Zomba           | 81.2                   | 18.8                     |      |
|                  | Nsanje          | 81.1                   | 18.9                     |      |
|                  | Blantyre        | 79.3                   | 20.8                     |      |
|                  | Mulanje         | 79                     | 21                       |      |
|                  | Mangochi        | 76.5                   | 23.5                     |      |
|                  | Chikwawa        | 75.5                   | 24.5                     |      |
|                  | Mwanza          | 73.8                   | 26.2                     |      |
|                  | Neno            | 68.5                   | 31.5                     |      |
|                  | Machinga        | 68.1                   | 32                       |      |
|                  | Thyolo          | 66.3                   | 33.7                     |      |

MDG Goal 7 for Improved Water Sources Target 10 for Malawi: 74%

**Table 3** MDG goal and access to potable water in the wet season by district

| Category         | District        | Safe water sources (%) | Unsafe water sources (%) |      |
|------------------|-----------------|------------------------|--------------------------|------|
| Country Location | Malawi          | 74                     | 26                       |      |
|                  | Urban           | 94.1                   | 5.9                      |      |
|                  | Rural           | 70.5                   | 29.6                     |      |
| By Gender        | Male            | 73.9                   | 26.2                     |      |
|                  | Female          | 74.4                   | 25.6                     |      |
| North            | Northern Region | 72.9                   | 27.1                     |      |
|                  | Mzuzu           | 90.6                   | 9.4                      |      |
|                  | Karonga         | 80.8                   | 19.2                     |      |
|                  | Mzimba          | 73.6                   | 26.4                     |      |
|                  | Rumphi          | 73.1                   | 27                       |      |
|                  | Likoma          | 66.3                   | 33.7                     |      |
|                  | Chitipa         | 62.8                   | 37.2                     |      |
|                  | Nkhatabay       | 57.1                   | 42.9                     |      |
|                  | Centre          | Central Region         | 68.2                     | 31.8 |
| Lilongwe city    |                 | 92.7                   | 7.3                      |      |
| Salima           |                 | 82                     | 18.1                     |      |
| Ntcheu           |                 | 76.6                   | 23.4                     |      |
| Ntchisi          |                 | 68.4                   | 31.6                     |      |
| Nkhotakota       |                 | 68                     | 32.1                     |      |
| Dedza            |                 | 66.3                   | 33.7                     |      |
| Mchinji          |                 | 63.9                   | 36.3                     |      |
| Lilongwe         |                 | 63.9                   | 36.1                     |      |
| Kasungu          |                 | 53.3                   | 47.1                     |      |
| Dowa             |                 | 53.2                   | 46.8                     |      |
| South            |                 | Southern Region        | 79.4                     | 20.6 |
|                  |                 | Zomba city             | 97.2                     | 2.8  |
|                  | Blantyre city   | 94.7                   | 5.3                      |      |
|                  | Chiradzulu      | 88                     | 12.1                     |      |
|                  | Phalombe        | 86.9                   | 13.2                     |      |
|                  | Balaka          | 83.2                   | 16.8                     |      |
|                  | Zomba           | 81.3                   | 18.8                     |      |
|                  | Nsanje          | 81.1                   | 18.9                     |      |
|                  | Mulanje         | 80.2                   | 19.8                     |      |
|                  | Blantyre        | 79.6                   | 20.5                     |      |
|                  | Mangochi        | 76.5                   | 23.5                     |      |
|                  | Chikwawa        | 74.9                   | 25.1                     |      |
|                  | Mwanza          | 74.3                   | 25.7                     |      |
|                  | Neno            | 68.6                   | 31.4                     |      |
|                  | Machinga        | 67.4                   | 32.6                     |      |
|                  | Thyolo          | 66.4                   | 33.6                     |      |

MDG Goal 7 for Improved Water Sources Target 10 for Malawi: 74%

### Dry season water sources

Looking at Malawi as a whole, 74 percent of the people have access to safe water, with the majority (48 percent) relying on borehole water. Only 2.7 percent of the population use piped water inside a dwelling unit (DU), 4.6 percent use piped water into a yard/plot and 12.4 percent use piped water from a communal stand pipe. The largest source of unsafe water (18 percent) is from unprotected wells. In urban areas, 94 percent of the population have access to safe potable water while in the rural areas access to safe water is at 70 percent. Looking at the regions, access is at 73 percent for the north, 68 percent in the centre and 79 percent in the south. Of the three regions, the centre is lagging behind followed by the north. Use of piped water into the dwelling units is highest in the cities, Zomba City having the highest (24 percent) followed by Mzuzu (16 percent), Lilongwe (15 percent) and Blantyre (14 percent). The use of borehole water is highest in the southern region with twelve out of thirteen districts having access greater than 50 percent with Phalombe district (43%) as the only exception. In the central and northern regions, the highest access to boreholes (greater than 50 percent) was reported for Karonga (57 percent), Mzimba (57 percent), Ntchisi (58 percent), Salima (67 percent), Dedza (53 percent) and Ntcheu (57 percent). Highest use of unprotected wells (greater than 30 percent) was reported in the central region districts of Kasungu (37 percent), Dowa (33 percent), Lilongwe (31 percent) and Mchinji (33 percent). There is need for more water supply interventions in these districts.<sup>9</sup>

### Wet season water sources

Access to safe water in the wet season is statistically similar to the dry season throughout the country. Indeed use of piped water into the dwelling units is still highest in the city areas while the use of borehole water is still highest in the southern region. Some use of rain water is reported during the wet season with a national average of 0.1 percent access and regional figures of 0.2 percent in the north, 0.1 percent in the centre as well as in the south. Highest use of rain water at district level is practiced in Likoma (2.5 percent). Rainwater harvesting for domestic use is yet to be adopted by majority of households in the country presenting an opportunity for its promotion.<sup>10</sup>

### Comparisons of dry and wet seasons water sources

Overall, access to safe water in Malawi is almost the same for the wet and dry seasons (Figure 3) and (Table 3) (Table 1). The regional trends across the country also suggest that the geographical location (for example proximity to a lake) is inconsequential. However, the state of, or lack of water storage infrastructure may be an important factor as seen from the slightly lower access to safe water during the dry season. Indeed this is more apparent in the rural areas, probably reflecting the low capacity of water service providers to harvest or store enough water for all year round supply.

### Trends in household water sources (1998 versus 2008)

The 2008 Census shows an improvement in access to safe water compared to 1998 Census findings, which reflects efforts by various stakeholders to improve access to safe water. However, rural areas throughout the country did not meet the national water target for MDGs as shown in Figure 4. The northern and central rural areas were the lowest performers in terms of the MDG target. Nonetheless, the south reported a much improved access in 2008 for both wet and dry seasons compared to the other regions and reported the highest improvements for both wet and dry seasons between 1998 and 2008. Urban areas performed better in access to safe water, which perhaps

reflects the higher usage of piped water (in dwelling, in yard and communal). There was a significant increase in borehole water usage in the rural areas (from 29 percent to 55 percent), against a significant decrease in the usage of unsafe water sources (46 to 30 percent) in the rural areas. However, the increase still does not meet the Malawi target for MDG on improved water sources of 74%. There is scope to improve on this.<sup>11</sup>

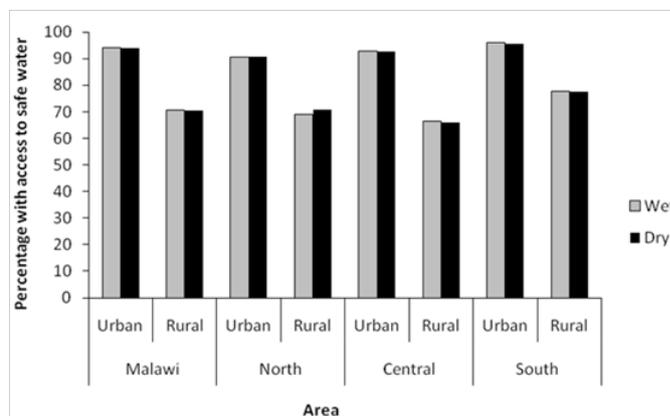


Figure 3 Access to safe water in rural-urban Malawi in wet and dry seasons.

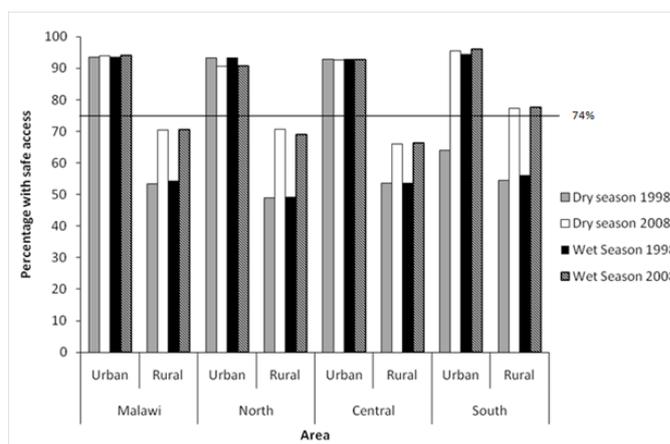


Figure 4 Comparison of access to safe water between 1998 and 2008.

### Access to potable water and the MDG goal on improved water sources

Use of piped water is significant in metropolitan areas of Mzuzu, Lilongwe, Zomba and Blantyre while the rural areas exhibit heavy reliance on borehole water. As shown in Figure 4, all the urban areas across the country meet the national goal for MDG while the rural areas fall short of the goal. This probably indicates that reliance on borehole water alone is not adequate for the national MDG water target to be met given the significant numbers of non-functioning boreholes.<sup>12</sup>

### Conclusion

This paper assessed Malawi's MDGs water and sanitation targets attainment at district level and addressed the question on whether each Malawi district will be able to meet the MDGs targets on access to potable water and basic sanitation based on the 2008 Malawi Population Census dataset covering all 28 districts. The analyses focused on whether Malawi twenty-eight (28) districts have met the MDGs targets on access to potable water (74%) and basic sanitation (86%). The results indicate that while Malawi was able to meet

the MDGs targets on access to potable water and basic sanitation at national level, some districts missed the MDGs targets on water (74%) and sanitation (86%). All cities (Blantyre, Lilongwe, Mzuzu and Zomba) met the Malawi MDG targets for access to potable water and basic sanitation. However, 12 out of 28 districts missed the MDGs target on basic sanitation. Two out of six districts in the north did not meet the sanitation target (Mzimba, 84% and Karonga, 82%), while four out of nine districts in the centre (NkhotaKota, 83%; Lilongwe, 82%; Salima, 79% and Mchinji, 78%) and six out of thirteen districts in the Southern region (Neno, 86%; Machinga, 85%; Mwanza, 83%; Phalombe, 79%; Chikwawa, 64% and Nsanje, 62%) missed the target. On access to potable water MDG target, Rumphu, Chitipa, Nkhatabay and Likoma in the North missed the MDG target; NkhotaKota, Ntchisi, Dedza, Mchinji, Lilongwe, Kasungu and Dowa missed the target in the Central region and Neno, Machinga and Thyolo missed the target in the Southern region. These results signify that a country can meet the MDGs targets at national level and yet miss the same targets at district or sub-district level. The results are instructive in that policy makers in the water and sanitation sector should not base interventions based on national aggregated figures but should base water and sanitation programming on district level data. There is need to focus more water and sanitation interventions in those districts that missed the MDGs goals. To target further the interventions within each district, the same analyses can be done for each sub-district area such as Traditional Authority (T.A) area.

## Acknowledgements

The authors acknowledge the financial support of the Lilongwe University of Agriculture and Natural Resources (LUANAR) to the study. The National Statistical Office provided the comprehensive 2008 census data set that allowed the authors to carry out the analyses. We acknowledge the input of late Felix Kalowekamo in reviewing the methodology and theoretical framework for analyzing the NSO dataset in the initial stage.

## Author contributions

Kenneth Wiyo the principal investigator and Wilfred Kadewa the co-investigator originated the study concept, designed the study and the study tools. They analyzed the data, generated and discussed the results, drew conclusions and wrote and edited the paper.

## Conflicts of interest

The authors declare no conflict of interest. The funding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript and in the decision to publish the results.

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