



Inequality in Education and Wealth in Tanzania: A 25-Year Perspective

Emmanuel Maliti¹

Accepted: 18 January 2018 / Published online: 29 January 2018
© UNU-WIDER 2018, corrected publication February 2019

Abstract The literature on inequality in Tanzania has been dependent on limited rounds of methodologically different household budget surveys. The literature in question seldomly goes beyond analysis of inequality trends between two rounds of surveys, thereby ignoring longer period inequality trends. This study makes use of six rounds of methodological stable Demographic and Health Surveys (DHS) to present a half-century trend in education and wealth inequality in Tanzania. Education inequality persists but has been declining between rural and urban areas and particularly between Dar es Salaam and other regions. Gender inequality in education has also consistently been on the decline across different age ranges, more so for older individuals than younger ones. Wealth inequality as measured by a composite index has been declining as well—mostly an outcome of the declining proportion of households in the poorest quantile in rural areas compared to an increasing proportion of urban households in the same quantile. In other words, using the DHS’s composite index of selected assets, the Tanzanian society is increasingly becoming equal in both education and wealth. The paper also discusses policy options to further reduce inequalities.

Keywords Tanzania · Education · Wealth · Inequality · Gini · Gcov

1 Introduction

Measuring trends in inequality within and between countries, and the consequences of inequality on development outcomes are receiving considerable attention in academic literature and among development agencies. As methods of measuring inequality are advancing, it is well documented that inequality not only constrains potentials for future economic

The original version of this article was revised due to a retrospective Open Access order.

✉ Emmanuel Maliti
emmanuel.maliti@gmail.com

¹ Consultant, Dar es Salaam, Tanzania

growth (Perotti 1996; Nissanke and Thorbecke 2006; Berg and Ostry 2013), but also decelerates efforts on poverty reduction (Ravallion 1997, 2005; Thorbecke and Charumilind 2002; Nel 2006). In the wake of such evidence, it is no surprise that 'reduce inequality within and among countries' emerged as one of the 17 Sustainable Development Goals (SDGs) to guide international development efforts in the next 15 years. In addition to vertical inequality (inequality between individuals) which has largely dominated the literature, horizontal inequality is receiving growing interest (inequality between subnational regions, locations and groups drawn along social identity lines, such as religion, ethnicity, and gender) (Stewart 2000; Stewart et al. 2010). The interest on horizontal inequality is on the rise for many reasons, for instance, the potential intersections between wealth inequality and conflicts (Lipsky 1968; Gurr 1970; Bush and Saltarelli 2000).

There are three reasons why a developing nation like Tanzania needs to advance its knowledge on trends in inequality. First, poverty incidences have remained relatively high in Tanzania despite more than a decade of relatively strong and stable economic growth (Arndt et al. 2015; Mashindano and Maro 2011). Notwithstanding a declining trend, 28.2% of Tanzanians remain poor, more so in rural areas (33.3%) than in urban areas (21.7%) (United Republic of Tanzania 2012). Despite the common argument that rapid economic growth is often associated with uneven regional and urban development (Kim 2008), the work of Atkinson and Lugo (2010) has shown that inequality has a role in explaining the growth-poverty reduction mismatch in Tanzania. It is therefore of interest to policy makers to be aware of long historical inequality trends, instead of, as has been the case with many studies, inequality trends for a year or between only two successive surveys.

The second reason Tanzania should pay attention to its long historical trends in inequality is its long track record of undertaking economic reforms that were initiated from the early 1990s (economic liberalisation, state deregulation, etc.). Such reforms had considerable implications on the ways in which Tanzanians engage in economic and social activities. Reference is made, for instance, to the widening range of possible means for households to engage in income generating activities. Thus, several years of inequality data has the potential to reveal the correlation between the ongoing reforms and developmental outcomes. Third, one of the outcomes of the ongoing reforms was a significant rise in public and private investments in the social sectors of education and health. The government's decision to abolish primary school fees in 2001 coupled with a country-wide expansion of institutions of secondary education raised the net enrolment ratio in primary school from 88.5% (2003) to 97.3% (2007), and in secondary education from 6.3% (2003) to 33.17% (2013) (United Republic of Tanzania 2013). An examination of changes in education inequality over the years, is therefore one of the ways of assessing whether such policy initiatives have had an impact on inequality. Trends in spatial inequality in education could, for instance, compel the government to increase spending in locations that are lagging behind in access to education. This is an important aspect especially in countries like Tanzania whose public finance system is highly centralized.

This study makes use of six series of repeated national level cross-sectional Demographic and Health Surveys (DHS 1991, 1999, 2004, 2007, 2010 and 2015) to track trends in inequality in education and wealth in Tanzania over the last 25 years. Wealth data that are based on a composite index of selected assets are adopted as a measure of wellbeing in the absence of data on income and consumption expenditure from the DHS series. The study primarily answers the research question: 'Is horizontal inequality in education and wealth increasing or decreasing in the 25-year interval between 1991 and 2015?' The key finding is that both education and wealth inequality persists, but have been declining over the years. Education inequality, for instance, has been declining between rural and urban

areas, and between Dar es Salaam and other regions. Wealth inequality as measured by a composite index of selected assets has been declining as well—mostly an outcome of the declining proportion of households in poorest quantile in rural areas compared to an increasing proportion of urban households in the same quantile.

The subsequent sections of this paper are arranged as follows. The next section presents a brief review of the concepts on inequality. Section 3 describes the data used to compute different measures of inequality. It is followed by Sect. 4 that is entirely devoted to methodological approaches. Section 5 covers descriptive statistics and contains a discussion of the results from education and wealth statistics generated from applying methods discussed in Sect. 4. Section 6 highlights the limitation of the study and Sect. 7 concludes.

2 Literature Review

2.1 Theories and Concepts on Inequality

The concept of “inequality” if not from the beginning can trigger an unmanageable number of interpretations. This study defines inequality simply as the state of being unequal (UN 2015). To operationalise the concept of inequality, two questions need to be answered: ‘inequality of what?’ and ‘inequality between whom?’ (McKay 2002; Green and Kesselman 2006). The first question describes some valued attributes or outcomes such as income, social status, wealth, education, health, living conditions and opportunities. The second question refers to units of a society (individuals, households, groups, geographical areas etc.) to which the valued attributes or outcomes can be distributed across. In other words, inequality measurement involves explanation of the distribution of attributes across different units (Cowell 2009). With regard to the question of ‘inequality between whom’, it is necessary to separate ‘vertical inequality’ from ‘horizontal inequality’. Disparities between individuals or households is primarily referring to vertical inequality and is the most common approach used to study inequality. In contrast, horizontal inequality refers to disparities observed between population groups as defined by region or geographical areas, ethnicity, and class or religion (Stewart 2000). A conceptual approach by Milanovic (2005), for instance, gives good guidance on how to assess horizontal inequality and is more relevant to the nature of the DHS’s education and wealth data. The concept takes a group as the unit of observation, giving a straightforward comparison of data across relevant groups. A typical example is to compare the proportion of households, for instance, in different wealth quantiles. It allows the use of weighted data, thus giving more importance to groups that have larger populations.

Inequality has been one of the concerns of the development theory, particularly on the valued attributes of standards of living, such as income/wealth, education, health, and nutrition (Conceição and Bandura 2009). Its prominence in the development theory results from the failure of Kuznet’s theory which perceives the notion that growth will “lift all boats”. Even in the absence of such theoretical thinking, the normative theories of social justice consider economic inequalities as inherently unfair (Rawls 1971; Nozick 1974). That is, it is unfair for two individuals with exactly the same behaviour and characteristics to enjoy vastly unequal consumption and welfare levels, simply because one individual, for instance, has received a large inheritance and the other has not (Piketty 2014). Equality is therefore an integral part of a just society, and distributive justice is an aspect that is not only fundamentally egalitarian in nature, but is also morally impartial (Green and

Kesselman 2006). From an egalitarian point of view, the importance of equality should not be compromised by interests in the maximization of efficiency, stability, productivity, community, or even individual liberty (Macleod and Eisenberg 2006).

2.2 Literature on Inequality in Tanzania

Improved data availability (population censuses, national level cross sectional surveys including the DHS and Household Budget Surveys (HBS)), as well as, novelties in statistical methods, have inspired increasing interest in studying different dimensions of inequalities in Tanzania. The renowned development indices such as UNDP's Human Development Index (HDI) in which education is one of the evaluated dimensions, separates regions such as Arusha, Kilimanjaro, Dar es Salaam, Iringa, Ruvuma, Mbeya and Tanga (with the highest human development status) from Kigoma, Singida, Dodoma, Kagera, Tabora, Shinyanga and Pwani (with the least human development status) (ESRF 2014). Arusha, Kilimanjaro and Dar es Salaam are the only regions in Tanzania found to have HDI values that are comparable to countries with medium levels of human development, with the rest corresponding to HDI values of low HDI countries. The World Bank, African Economic Research Consortium (AERC) and the African Development Bank (AfDB) (2012) position the education environment in urban areas as far better than it is in rural areas. Primary schools in the former were found to be four times more likely to have electricity, water and sanitation than their counterparts in rural areas. Moreover, one in five teachers (20%) in rural locations were found to be absent from schools on any given day, against 36% in schools located in urban areas (World Bank, AERC and AfDB 2012). Such disparities in education infrastructure and service delivery culminate in inequalities in several education outcomes. Primary school National Attendance Rate (NAR) ranges from 91% in Kilimanjaro and Ruvuma regions to 66% in Tabora region (ESRF 2014). Furthermore, the education attainment ratio is higher for males (95%) and urban areas (95%) than for females (85%) and rural areas (85%) for standard one education (ESRF 2014).

Other studies have assessed inequality in Tanzania in the context of growth and poverty reduction (United Republic of Tanzania 2005; Demombynes and Hoogeveen 2007; Hassine and Zeufack 2015; and World Bank 2015). Poverty is mostly associated with rurality as over 80% of the poor and the extremely poor in Tanzania live in the rural areas—with more than half of them depending on subsistence agriculture for their livelihoods (World Bank 2007, 2015). The poverty analysis in Tanzania shows that the period 2007–2012 was characterised by an uneven geographical decline in poverty with the poor benefitting disproportionately from economic growth in sharp contrast to the period 2001–2007, where the growth benefitted mainly the country's richer groups (World Bank 2015). In the latter period, extremely poor households became poorer (declining consumption levels of the poorest 10% of the population) while very rich households got richer (Policy Forum 2009). Using the absolute measures of poverty rates, Atkinson and Lugo (2010) came up with similar observations. They show that during the period under consideration (2001–2007), the bottom two quantile groups (mostly comprising of households below the poverty line) experienced no growth in their per capita consumption. Reasons for the growth-poverty reduction mismatch in Tanzania range from inaccuracies in the reporting of economic data (use of different weights that could underestimate or overstate the value of outputs); a young pyramid shaped population structure, under-educated population to low growth rates in the agricultural sector which accounts for the majority of the population (Mashindano and Maro 2011). The agricultural sector, for instance, has been growing at less than half

of the growth rates in the industry and services (World Bank 2015). All these studies give a good picture of the disparities across different dimensions and mostly rely on the HBS which covers shorter time frame than DHS and suffer some comparability issues due to changes and improvements of the survey methods. The studies also fail to present a long-term trend of inequality, something that this study attempts to address.

2.3 Data

This study draws on six rounds of DHS spanning over a quarter of a century from 1991 to 2015. DHS overcomes a number of limitations of other national level surveys such as the HBS. First, the DHS extends over a 25 year period through six repeated cross sectional surveys against four series of HBS (1991/92, 2001/02, 2007 and 2011/12). Second, the latest DHS is the most recent, dated 2015 against 2011/12 for the case of HBS. DHS data therefore presents a more recent picture of the state of inequality in Tanzania. Third, the DHS is more methodologically stable than HBS (for example, on the definitions and measurements of many indicators etc.) and allows a more credible comparison of data from one round to the other. Fourth, HBS survey data is less interested in households' ownership of assets, which is an important socio-economic aspect that differs from income measures of poverty, and is prone to measurement errors and reporting biases. The HBS is a consumption-based survey that excludes expenditures on durable goods, making it more likely that inequality is much higher than what HBS actually reports (World Bank 2015). Despite its limitations, the DHS wealth index is not affected by such challenges because wealth data are obtained directly from interviewing the households. It is however worth mentioning here that DHS survey rounds are constrained by the change of geographic classifications over time. Specifically, the DHS for 2004, 2007, and 2010 share similar zonal classifications, while the DHS for 1991 and 1999 as well as the latest DHS 2015 maintain slightly different classifications (see Tables 8, 9 and 10 in "Appendix").

The unit of analysis for wealth inequality is the household, whereas in the case of education it is the individual. The education variable from the DHS is the number of years of schooling for each member of the surveyed households. The DHS wealth index is divided into quintiles from one (lowest) to five (highest). The index has been constructed using two sets of information. First is the information on households' ownership of assets such as cars, bicycles and televisions and second is the information on living conditions of the surveyed households that comprises of items such as materials used to construct the houses, source of drinking water and type of sanitation facilities (United Republic of Tanzania 2010). Asset ownership is consistent with the concept of human wellbeing and has frequently featured in literature on growth, poverty, and inequality (Persson and Tabellini 1994; Birdsall and Londofio 1997; Deininger and Squire 1998; Ravallion 1997; Deininger and Olinto 1999). Literature has validated the DHS wealth index as a good proxy for income or expenditures, and fairly determines the magnitude of the differences between the rich and the poor (Wittenberg, 2009, 2011; Filmer and Scott, 2012). Moreover, an asset may be a more reliable indicator of economic well-being in the long run (Wittenberg and Leibbrandt 2017) and is measured with less error (Filmer and Pritchett 2001; McKenzie 2004). The categorical nature of the wealth index has certain advantages over continuous nature of the income inequality measures such as the Gini. Unlike consumption data, assets are easily measured in categorical forms and thus result into more reliable asset-based wealth index than consumption based measures like the Gini. However, because of similarities in living standards, there are risks of 'clumping' and 'truncation' for categorically based wealth index especially for rural households (McKenzie 2004). The risk is however

minimised as the DHS wealth index includes a combination of durable asset ownership, housing features, and characteristics associated with access to utilities.

3 Methodology

Following Stewart et al. (2010), two indices are applied to track changes in education inequalities over the past half century. The first is the Group-weighted coefficient of variation (Gcov) which is a common measure of horizontal inequalities and has been applied in several empirical studies on inequality (see for instance, Williams and Doessel 2006; and Williamson 1965). Gcov primarily compares the mean of each group with the overall average. The Gcov is unit-free and its values only make sense when they are compared over a series of years highlighting how inequality is changing over time. Any Gcov beyond zero on its own does not tell much about inequality. A Gcov value of 0.25 for year 1 and 0.45 for year 2 would imply more variability of years of education relative to the mean years of education (high inequality) in year 2 than in year 1 (relatively low inequality). Gcov has a value of 0 (no inequality) when the variable of focus, such as years of education, is the same for all individuals (the numerator of the Gcov expression will be zero because the variance between the group mean and the national mean is zero). However, the Gcov index is less concerned with within-group inequalities (Jackson 2015) and not bound from above. That is, it tends to become larger especially when the mean of the variable of focus is low (Bellù and Liberati 2006).

This study further follows Stewart et al. (2010) by attaching population weights to the Gcov expression (a population-weighted measure). Therefore, changes in the position of small groups get less weight than those of larger groups. Without such population weighting, changes in a small group would show the same effect as one involving a large group (Stewart et al. 2010).

$$GCov = \frac{1}{\bar{y}} \left(\sum_r^R p_r \left((\bar{y}_r - \bar{y})^2 \right) \right)^{\frac{1}{2}}$$

The second measure is the Group-weighted Gini Coefficient (Ggini) which compares the mean value of every group with the same value for every other group. It is based on the size of the differences between group averages of a variable of focus and the group's relative population size (its share of population). Similar to the Gcov, the Ggini statistic on its own does not tell much about inequality, but gives a picture of how the inequality is changing over time when comparing statistics over several years. A Ggini index that is based on the mean years of schooling can be interpreted as a measure of how concentrated the total stock of education is in any one group. A value of zero would mean that all groups being analysed maintain the same mean years of schooling, while a value of one implies a highly unequal society where one group has exclusive access to all stock of education. Like the Gcov, the Ggini has a weakness of being less concerned with within-group inequalities (Jackson 2015; Murshed 2010).

$$GGini = \frac{1}{2\bar{y}} \sum_r^R \sum_s^S p_r p_s |\bar{y}_r - \bar{y}_s|$$

where $\bar{y}_r = \frac{1}{n_r} \sum_i^{n_r} y_{ir}$ = Zone r mean value, \bar{y} = Sample mean of a variable under consideration, y_{ir} = Quantity of variable under consideration of i th member of zone r , \bar{y}_s = Mean of a variable under consideration of group s , \bar{y}_r = Mean of a variable under consideration of group r , p_r = Zone r population share, p_s = Zone s population share, R = Zone r population size, n = Number of zones.

The two measures complement each other. While Gcov has the advantage of measuring differences of each group from the global mean, in contrast, the Ggini compares every group with every other group. As can be noted from the Ggini expression, the formula is based on actual values of the variable in question, whereas the Gcov squares values making Gcov more influenced by outliers or extreme values (anomalously low or high values) (De Maio 2007; Stewart et al. 2010). By squaring observations, the Gcov gives more weight to observations further from the mean, whereas the Ggini gives relatively more weight to the middle of the distribution (Stewart et al. 2010). In other words, the Ggini expression gives equal weights to the variance.

Since the DHS wealth index consists of wealth ordering from lowest to the highest quantile (a minimum of 1 and a maximum of 5), Gcov and Ggini measures cannot be applied to assess wealth inequality. The study therefore follows Gwatkin's (2002) and World Health Organization's (2013) approaches which primarily make pairwise comparisons of differences and ratios of the proportions of households between two subgroups (that is, wealth quantile 1 and wealth quantile 5). The differences are simply obtained by subtracting the proportion of households in one subgroup from that of the other subgroup; whereas, for the ratio, the proportion of households in one group is divided by that of the other group.

4 Results

4.1 Descriptive Statistics

Table 1 through 3 illustrate descriptive statistics for the education variable. The households' mean years in education has consistently been on the rise across all the five areas of analysis (overall, geographical zones, gender, location, and regions). Across all the five areas, the mean values in 2015 are higher than the values in the base year of 1991. The largest increase has been the overall mean years of education which has nearly doubled from 3.9 years (1991) to 6.1 years (2015), mostly an outcome of gains in other regions. The mean value in 'other regions' nearly doubled from 3.8 years (1991) to 5.9 years (2015). A similar trend is observed for Dar es Salaam whose average mean years in education has increased by 3 years between 1991 and 2015.

Table 1 also shows that between 1991 and 2015 female members of the surveyed households have been gaining more than men. Female members of the surveyed households have added 2.4 years in their mean values of the education variable between 1991 and 2015 against 2 years for male members of surveyed households. Females have registered the second largest increase in the mean years of education after Dar es Salaam. The latter had 2.7 years added to its mean years of education during the period under review. Other regions, excluding Dar es Salaam, are advancing as well and have managed to add, on average, 2.1 years in their mean years of education (which is below the rate in Dar es Salaam by 0.6 years). To further reduce education inequality, years of education for other regions must rise at a faster rate to catch up with Dar es Salaam.

Table 1 Mean values of years in education (15 years +). *Source:* United Republic of Tanzania (1991, 1999, 2004, 2007, 2010, 2015) and author's calculations

	1991	1999	2004	2007	2010	2015	Difference 1991 and 2015
Overall	3.9224	4.7983	5.0016	5.4631	5.7407	6.106	2.2
Gender							
Men	4.5728	5.3813	5.5577	6.0572	6.2613	6.5559	2.0
Women	3.3219	4.2815	4.4944	4.9361	5.2650	5.6917	2.4
Location							
Urban	5.5633	6.3959	6.9380	7.2877	7.6234	7.8477	2.3
Rural	3.5363	3.9805	4.4252	4.9525	5.1616	5.3985	1.9
Regions							
Dar es Salaam	5.9795	6.8074	7.5079	7.7470	7.8201	8.6616	2.7
Other regions	3.8235	4.6435	4.9039	5.3575	5.6556	5.9531	2.1

As highlighted in Sect. 3, geographical zones differ for some DHS rounds. Thus, Tables 2 and 3 present the mean years of education only for the rounds of DHS that share the same zonal classifications. Table 2 presents trends between 1991 and 1999 showing a consistent increase in the mean years of education. The largest increase came from coastal and southern zones with a one-year addition to their mean years of education between 1991 and 1999. The remaining zones had less than a year increase in their mean years of education. The coastal zone comprises of the business capital Dar es Salaam, implying that better off regions gained more than the poorer regions.

Trends of the mean years of education for the other group of DHS data with the same geographical zones are presented in Table 3. Like the other group of DHS data, the current group of data shows a consistent upward trend in the mean years of education in all of the eight geographical zones. The leading zone was the Northern zone (Kilimanjaro, Tanga, Arusha, and Manyara) with the largest increase of 1.1 years to its mean years of education between 2004 and 2010. The remaining zones had less than a year increase in their mean values of years of education. Other zones have to significantly raise their mean years of education to catch up with zones such as Northern, Eastern and Zanzibar. Two regions in the Northern zone, that is Kilimanjaro and Arusha are historically (pre-and post-independence) more advanced in terms of the number of education institutions. The Northern zone was the place of residence of pre-independence Christian missionaries who invested

Table 2 Mean values of years in education: geographical zones—1991 and 1999. *Source:* United Republic of Tanzania (1991, 1999) and author's calculations

	1991	1999	Difference
Central zone	3.5648	4.1320	0.6
Northern highland zone	4.9112	5.2952	0.4
Coastal zone	4.3791	5.4257	1.0
Southern zone	3.7489	4.7834	1.0
Southern highland zone	3.6465	4.1134	0.5
Lake zone	3.5715	4.0345	0.5

Table 3 Mean values of years in education: geographical zones—2004 through 2010. *Source:* United Republic of Tanzania (2004, 2007, 2010) and author's calculations

	2004	2007	2010	Difference
Central	4.3672	4.6578	4.8998	0.5
Northern	5.2259	5.6738	6.3086	1.1
Eastern	5.6028	6.2016	6.0308	0.4
Southern	4.7290	4.9075	5.5776	0.8
Southern highlands	4.3543	4.8054	5.2664	0.9
Western	4.0468	4.2981	4.8490	0.8
Lake	4.9121	5.2281	5.4723	0.6
Zanzibar	5.8489	6.2879	6.4598	0.6

in modern education institutions (primary and secondary schools) parallel to their objective of spreading Christianity (Mesaki 2011).

Table 4 presents trends of the proportion of households in each of the five wealth quantiles, from the wealthiest (quantile 1) to the poorest (quantile 5). DHS rounds prior to 2004 did not compile information on wealth. The table illustrates an increasing proportion of households in quantile 1 and a corresponding decline in the proportion of households in the quantile 5. Whereas 20.1% of the households in Tanzania were in the quantile 1 in 2004, the proportion increased to 21.9 by 2015. The increase is equivalent to 1.8 percentage points between the two periods. In fact, the first three quantiles had a higher proportion of households in 2015 than in the base year 2004. It is only between 2007 and 2010 where the proportion of households in quantile 1 declined and corresponding to an increase in the proportion of households in quantile 5.

4.2 Education Inequality

4.2.1 Spatial Inequality in Years of Education

Tables 5 and 6 illustrate trends in educational inequality for individuals aged 15 + and 25 + years. The two tables show a decline in education inequality between rural and urban areas, and between Dar es Salaam and other regions for both age groups. Trends between geographical zones cannot be described due to differences in zonal classification between different rounds of the DHS. For the age group 15 + years, both the rural–urban and Dar es Salaam–other regions inequalities display a 0.11-point decline in the Gcov value between 1991 and 2015. Specifically, the decline was from 0.43 in 1991 to 0.31 in 2015 for the case of rural–urban and from 0.53 (1991) to 0.42 (2015) between Dar es Salaam–other regions.

Table 4 Wealth quantiles 2004 through 2015. *Source:* United Republic of Tanzania (2004, 2007, 2010, 2015) and author's calculations

	2004	2007	2010	2015	Difference 2004 and 2015
Quantile 1	20.1	22.1	19.4	21.9	1.8
Quantile 2	22.4	22.8	21.4	23.7	1.3
Quantile 3	19.1	18.8	19.9	20.4	1.3
Quantile 4	19.6	18.4	19.7	18.2	− 1.4
Quantile 5	18.8	17.9	19.6	15.9	− 3.0

Table 5 Aggregate measures of horizontal inequality in years of education. *Source:* United Republic of Tanzania (1991, 1999, 2004, 2007, 2010, 2015) and author's calculations

	Zones	Gender	Rural/urban	Capital/others
A: Individuals 15 + years olds				
Gcov				
1991	0.31673	0.22569	0.42978	0.52507
1999	0.30468	0.16236	0.37404	0.41996
2004	0.37380	0.15049	0.40394	0.50147
2007	0.34680	0.14536	0.34680	0.41849
2010	0.32405	0.12284	0.34312	0.36253
2015	0.33079	0.10017	0.30788	0.41929
Δ	+	-	-	-
Ggini				
1991	0.06069	0.07967	0.10772	0.04821
1999	0.06739	0.05726	0.10493	0.03955
2004	0.06293	0.05311	0.10472	0.04566
2007	0.06762	0.05127	0.08909	0.03836
2010	0.05185	0.04336	0.08938	0.03307
2015	0.00251	0.03536	0.08361	0.03891
Δ	-	-	-	-
B: Individuals 25 + years olds				
Gcov				
1991	0.45199	0.42115	0.60775	0.81619
1999	0.34935	0.27175	0.54662	0.44729
2004	0.35022	0.23568	0.46252	0.60816
2007	0.41710	0.22985	0.41754	0.54047
2010	0.33455	0.18156	0.42290	0.33455
2015	0.36816	0.17838	0.37076	0.53412
Δ	-	-	-	-
Ggini				
1991	0.08714	0.14870	0.15036	0.07437
1999	0.07835	0.09589	0.12463	0.05132
2004	0.06632	0.08320	0.11914	0.05530
2007	0.07879	0.08107	0.10688	0.04958
2010	0.05976	0.06406	0.10942	0.04365
2015	0.00278	0.06296	0.10016	0.04955
Δ	-	-	-	-

Δ is change from 1991 to 2015

These findings are in line with the HBS which also monitors access aspects of the education sector in Tanzania. The 2011/12 HBS shows that the proportion of 15 + years individuals in Tanzania with no education declined from 24% in 2007 to 19% in 2011/12, more so in rural areas (4.3 percentage points) than in Dar es Salaam (3.5 percentage points) and other urban areas (4.2 percentage points). The decline in spatial inequality in education is an outcome of an increase in the proportion of 15 + years old individuals enrolling in upper secondary education (Form V–VI) in other urban areas and rural areas coupled with a decline in the same in Dar es Salaam over the same period (United Republic of Tanzania 2012). In the absence of scientific studies, some of the grey literature highlights potential drivers of declining inequality in education. They include, liberalization of the education

Table 6 Rural–Urban inequality in wealth (proportion of households in quantile 1 and 5). *Source:* United Republic of Tanzania (2004, 2007, 2010, 2015) and author's calculations

	Rural Q1	Urban Q1	Difference urban–rural	Ratio urban/rural	Rural Q5	Urban Q5	Difference rural–urban	Ratio rural/ urban
2004	7.8	63.0	55.2	8.1	23.3	2.9	20.4	8.0
2007	10.3	65.1	54.8	6.3	22.2	2.6	19.6	8.5
2010	6.5	62.7	56.2	9.6	24.5	3.3	21.2	7.4
2015	7.2	58.1	50.9	8.1	20.8	3.7	17.1	5.6

sector which resulted into mushrooming of private schools, colleges and universities in the business capital Dar es Salaam and other regions (United Republic of Tanzania 2009, 2015).

The largest drop in education inequality can be observed for individuals aged 25 + years. Specifically, the value of the Gov between Dar es Salaam and other regions declined from 0.82 in 1991 to 0.53 in 2015—a difference of 0.29 points between the two years. The drop in education inequality between rural–urban areas was also relatively large, from 0.61 in 1991 to 0.37 in 2015—a 24-point decline. Such a decline for individuals aged 25 + years implies that access to higher education (education beyond secondary school) has increased across all regions, thus a decline in inequality between Dar es Salaam and other regions. It is worth highlighting that unlike income (which has no ceiling), there is a natural maximum number of years of schooling one can attain in every educational system (UNICEF 2015). Thus, as more individuals gain access to the mass education system, education becomes less concentrated in any one subgroup (UNICEF 2015).

Increasing private and public sectors' investment in school facilities and extensive country wide campaigns through the Primary Education Development Programme (PEDP) and the Secondary Education Programme (SEDP) which have significantly raised enrolment and increased school retention at the primary level potentially explain the observed trends. The education programmes were largely supported by significant resources as evidenced by increased state budgets to the education sector in each subsequent year of programme implementation, which supported among other things, the expansion of school infrastructure as well as the provision of books through the 'capitation grant' mechanism (Sumra and Rajani 2007). The two programmes reversed the adverse effects of the early 1980s structural adjustment programmes which reduced government social sector spending and introduced school fees which ultimately excluded the poor from the education sector. The refocusing on social sectors in Tanzania was a mirror image of the change in the international discourse from the neoliberal structural adjustment programs in the 1980s to the poverty reduction strategies that placed emphasis on non-income poverty aspects in terms of access to social services. Such international developments were instrumental in increasing resources for social sectors. The United Nations' Millennium Development Goals had an explicit goal on enrolment in primary education, which led to the resurgence of Official Development Assistance (ODA) from US\$72 million to US\$128 billion between 2000 and 2009, most of which went to finance social sectors (Kenny and Sumner 2011).

Since 2001, Tanzania has experienced an important economic growth that did not translate into a significant decline in poverty. Poverty started declining only over the period 2007–2012. As poverty in Tanzania is associated with lower levels of education, the World

Bank's (2015) regression analysis of the determinants of poverty in Tanzania shows that declining poverty rates during the period 2007 and 2012 were driven mainly by an improvement of households' endowments in assets and returns to education, which in turn raised the earnings of the poorest. In contrast, during the period 2001–2007 growth benefitted mainly the country's richer groups (World Bank 2015). Table 15 in "Appendix" shows that prior to the 2007–2012 period, the declining trend of education inequality was relatively weaker—the period where economic growth had relatively less effect on poverty reduction. For instance, during the period 2001–2007 the Ggini and Gcov indices show some incidences of increasing inequality or cases of no change in inequality trends contrary to the trends during the period 2007–2012 where the values of most of the indices have been consistently declining.

4.2.2 Gender Inequality in Years of Education

Inequality in education by gender has also consistently been on the decline. Table 3 shows that the Gcov values for individuals aged 15 + years old and 25 + years old based on gender declined by more than half between 1991 and 2015. Specifically, gender inequality in years of education for the 15 + years old declined from 0.23 in 1991 to 0.10 by 2015 (Gcov measure of inequality). The results are in line with evidence from the HBS. The 2011/12 HBS shows a decline in the proportion of individuals with no education for both sexes, more so for women at 5.6 percentage points from 29.5% in 2007 to 23.9% in 2011/12 than men at 4.0 percentage points from 16.9% to 12.9% over the same period. Increasing private and public sector' investments in school facilities and extensive country-wide campaigns potentially explain the trends observed. Despite the declining trends, inequality persists with about 31% of women in rural areas still found to be not educated at all in 2012 against 6% in Dar es Salaam and 12% in other urban areas the same year (United Republic of Tanzania 2012).

A sharper decline of the Gcov value is also observed for the 25 + year olds, from 0.42 to 0.18 between 1991 and 2015. The Ggini values for gender differences in years of education have also declined by more than half for both age groups. Tanzania is therefore making significant strides in bringing about gender equality in the access to education front. This argument is further confirmed by the declining gender parity at the lower levels of schooling where the proportion of girls to boys in both public and private schools in mainland Tanzania increased from 98% in 2010 to 100% in 2012 further to a NER GPI of 1.022 in 2013 (more girls than boys) (Davis and Maliti 2015). A larger decline of education inequality for the 25 + year olds signals an increasing number of women accessing education services beyond secondary education. The number of women joining university level education has increased from 64,553 in 2010 to 89,191 in 2014 (United Republic of Tanzania 2010, 2016). However, further decline in gender based education inequality is constrained by well reported cultural norms that deny girls chance to advance in their education, including, being exposed to marriages and child birth at an early age (Mashindano and Maro 2011). In the presence of such cultural norms, it is not surprising that the country has an early onset of fertility where about 44% of women are either mothers or are pregnant with their first child by age 19—preventing access to education for girls, especially those in poor families (Davids and Maliti 2015).

The declining trend in education inequality in Tanzania is consistent with the global trend. The mean coefficient of variation in years of schooling for Sub-Saharan Africa has declined by more than half, from 0.17 in 1960 to 0.08 in the 2000s (UNICEF 2015). Thus, Tanzania, with a Gcov value of 0.32 in 2010 between rural and urban areas remains

relatively educationally unequal compared to countries such as South Africa with a covariance value of 0.30 in 2011 (Lam et al. 2015).

4.3 Wealth Inequality

Quantile 1 represents the wealthiest and quantile 5 the poorest. Table 6 reveals the large rural–urban inequality of wealth. In 2015, the proportion of rural households in the wealthiest quantile stands at 7.2% against 58.1% for urban residents (Table 6). It presents a difference of 50.9 percentage points with the proportion of urban households in the wealthiest quantile being eight times that of rural households. The gap between the two locations has however been on the decline. The gap used to be 55.2 percentage points back in 2004. Data suggests two reasons for the observed declining gap. First, the rate of the declining proportion of households in the poorest quantile in rural areas (quantile 5) is higher (2.6 percentage points between 2004 and 2015) than the decline in the proportion of households in the wealthiest quantile (quantile 1) (0.7 percentage points between 2004 and 2015) (Table 11 in “Appendix”). The declining proportion observed for rural households in the poorest quantile is in line with the data from the World Bank’s (2016) World Development Indicators (WDI) dataset which shows that between 2007 and 2012 the income of the bottom 40 has been growing at a higher rate than the rest of the population. The period was characterised by improvement of households’ endowments in rural areas (communication, transportation means), higher land ownership, and improved access to community infrastructure (mainly roads) (World Bank 2015). The second potential reason for the declining rural–urban inequality is the significant decline of the proportion of the urban wealthiest households (quantile 1) at 4.8 percentage points between 2004 and 2015 compared to the increase in the proportion of poorest (quantile 5) (Table 12 in “Appendix”). The latter increased by only 0.8 percentage points over the same period.

A large rural–urban gap is also observed in the quantile 5 (Table 6). In 2015, about 20.8 of the rural households were clustered in that quantile against 3.7% of urban households. There is a percentage points difference of 17.1 between the two locations. In other words, the proportion of rural households clustered in quantile 5 is six times that of urban areas in that quantile. The gap is however on the decline as it used to be 20.4 percentage points back in 2004. While the rural–urban difference in wealth is not surprising, an interesting aspect is the declining inequality over the years. Table 6 reveals two additional trends: (1) a declining proportion of the households in quantile 5 in rural areas; (2) an increasing proportion of urban households in the same quantile. The proportion of rural households in quantile 5 has declined by 2.6 percentage points between 2004 and 2015 whereas it has increased in urban areas by a percentage point difference of 0.8 over the same period. More than 80% of the poor and extremely poor households in Tanzania are residing in rural areas where the dominant economic activity is agriculture (World Bank 2015). The peculiarity of agriculture potentially explains the rural–urban differentials in outcomes such as income and wealth. Its growth rates have over the years remained behind that of urban dominant sectors. Between 2000 and 2015, the sector’s annual growth rates averaged 4.2% against the averages of 7.6% and 7.1% for the urban based sectors of manufacturing and services respectively (World Bank 2016). The latter is composed of the communication, financial intermediation, wholesale and retail and construction sectors which are far distanced and disconnected from the rural economic structure.

The wealth inequality between Dar es Salaam and other regions is a mirror image of the rural–urban wealth gap. About 83.6% of the households residing in Dar es Salaam are clustered in quantile 1 against 18.3% of residents in other regions. It is a gap of 65.3 percentage

Table 7 Dar es Salaam–other regions inequality in wealth (proportion of households in quantile 1 and 5)
Source: United Republic of Tanzania (2004, 2007, 2010, 2015) and author’s calculations

	DSM Q1	Other regions Q1	Difference DSM–other regions	Ratio DSM/other regions	DSM Q5	Other regions Q5	Difference DSM–other regions	Ratio DSM/ other regions
2004	91.6	17.6	74.0	5.2	0.5	19.3	– 18.8	0.03
2007	92.8	19	73.8	4.9	0	18.8	– 18.8	0.00
2010	77.3	17.1	60.2	4.5	0.3	20.9	– 20.6	0.01
2015	83.6	18.3	65.3	4.6	0.3	16.8	– 16.5	0.02

points between the two locations (Table 7). The gap is however on the decline as it used to be 74.0 percentage points back in 2004. On the other hand, other regions dominate Dar es Salaam when it comes to the proportion of households in quantile 5. About 16.8% of the households in other regions are in that quantile against 0.3% of the households residing in Dar es Salaam (Tables 13 and 14 in “Appendix”). The gap is 16.5 percentage points, a decline from 18.8 percentage points back in 2004. The general trend is that the proportion of households in Dar es Salaam in quantile 1 is on the decline whereas it is on the rise in the other regions. However, both locations are experiencing a declining proportion of households in quantile 5, more so for other regions (2.5 percentage points) than Dar es Salaam (0.3 percentage points) (Tables 13, 14 in “Appendix”).

Another interesting observation from Tables 6 and 7 is the declining proportion of households in quantile 1 and a corresponding increasing proportion of households in quantile 5 between 2007 and 2010. Prior to MKUKUTA II (the second medium-term poverty reduction strategy introduced in 2010), the country recorded limited progress in rural electrification and access to safe drinking water (Mashindano and Maro 2011), the two items of which are part to the DHS wealth index. Access to improved water sources increased marginally from 45.3% of households to 45.4% between 2000 and 2007 and that of electricity from 1.7% of rural households (2000) to 3.7% (2010) (World Bank 2016). Other items making up the wealth index further explain the observed rural–urban gap. Access to improved toilet facilities has remained a challenge, more so for rural households (only 9% of households have access to improved facilities) than urban households (22%), with the most common type of poor toilet facility being the open pit latrine that is used by 71% of households in rural areas (against 50% of households in urban areas) (ESRF 2014).

5 Limitations of the Study

Despite revealing some noteworthy details on wealth differentials between locations, there are important limitations of the DHS wealth index that are well summarised by Wittenberg and Leibbrandt (2017). The first limitation is that many of the household durable goods that make up asset schedules (e.g. televisions and refrigerators) require electricity, which tends to be more accessible in urban areas. As such, urban areas might score higher than rural areas because of such advantages. In other words, the DHS wealth scores will tend to extract an index which is a hybrid of “wealth” and “urbanness”. Second, the wealth index does not include some important rural assets such as livestock, making rural asset

holders look poorer than they should. Third, is the possible tendency of relatively richer households, especially in large cities, of replacing traditional assets such as bicycles and radios with modern ones such as TV and cars. Such practices could, for instance, lead to a sharp urban–rural divergence in the wealth index. Forth, because of the limited number and types of assets making up the DHS index, more important assets owned by extremely wealthy households as well as data on the number of possessions and their values may underestimate wealth inequality for all households in the country. It is therefore important to bear in mind that, by excluding modern assets, the wealth index can be considered to be a partial measure of wealth. That is, the conclusion that education and wealth inequality is declining is based only on some dimensions (education and limited number of assets included in the wealth index). Future studies could therefore add more dimensions into the analysis of inequality, for instance access to other social services, that are presented in the DHS or available in other national wide surveys. Such studies should be able to explain reasons behind the wide and increasing spatial disparity of service delivery that have been reported in literature and the reasons behind the inability of some population groups and some regions to participate in the growth process.

6 Conclusion

Differently from most literature on inequality in Tanzania, this study tracks inequality over a longer period of 25 years. The main finding is that horizontal inequalities in education and wealth have been on the decline. In other words, using mean years of education and a wealth index that can be considered to be a partial measure of wealth, the Tanzanian society is increasingly becoming equal in both education and wealth. Despite the declining trend, inequality remains an important development challenge in Tanzania. To further accelerate the declining inequality in education, public policy should focus on equity when it comes to investment in education facilities. Reference is made to strengthening the use of formula based transfers in resource allocation. The formula based intergovernmental transfer system introduced in 2004 has been reported to be weakly applied and requires some revisions—in particular, an assessment of the relevance of factors included in the formula. However, revision of the formula should avoid the temptation of embedding too many objectives, but instead, focus on, for instance, a limited number of indicators whose effectiveness can be guaranteed. Recent advances in timely availability of data increases the chances of introducing a formula that would contribute to further reduction in horizontal inequality in education. While not a subject matter of this study, the quality side of education services has suffered from the observed increased access to education (see World Bank 2014a, b; ESRF 2014). Thus, the quality aspect requires policy attention parallel to the objective of further improving access and the overall reduction in horizontal inequality in education.

A further reduction in rural–urban wealth inequality is possible through deliberate policy initiatives. The primary objective of rural development policies should be on boosting productivity of farms and enhancement of their commercialization which is associated with high levels of productivity. Potential policies to contribute to such objectives are well articulated in the World Bank (2014c) and include promoting competition among traders in rural settings through market information, reducing transportation costs, encouraging the use of modern inputs, connecting farmers to efficient value chains which include contract farming between farms and processing companies, and ensuring that these initiatives are not hindered by inconsistent policies. All of these together with facilitating climate-resilient agriculture and simplification of access to resources including land, agricultural finance,

and productive equipment practices are important factors without which inclusive growth that has the potential to narrow the rural–urban wealth gap will remain difficult to achieve. Moreover, reduction in spatial wealth inequality and poverty reduction could further be enhanced by policies that motivate moves to secondary towns which have proven to make up a much larger share of total growth and poverty reduction than migrations to metropolies (Christiaensen et al. 2017). Metropolitanisation comes with higher inequality, which reduces the poverty-reducing effects of economic growth (Sekkat 2017). Public investments should therefore go hand-in-hand with complementary policies that would attract highly-skilled individuals, increased infrastructure development and housing programs, improved space planning for industrial and businesses zones, land policies, entrepreneurship programs, and value-chain development within secondary cities to trigger the positive effects of agglomeration economies and skills complementarities (Christiaensen et al. 2017).

Open Access This book is licensed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO License (<https://creativecommons.org/licenses/by-nc-sa/3.0/igo/>), which permits any noncommercial use, sharing, adaptation, distribution, and reproduction in any medium or format, as long as you give appropriate credit to the UNU-WIDER, provide a link to the Creative Commons licence and indicate if changes were made. If you remix, transform, or build upon this book or a part thereof, you must distribute your contributions under the same licence as the original.

Appendix

See Tables 8, 9, 10, 11, 12, 13, 14, 15, and 16.

Table 8 Zonal classification: DHS 1991 and 1999. *Source:* United Republic of Tanzania (1991, 1999)

Zone	Regions
Coastal	Tanga, Morogoro, Coast, Dares Salaam and Zanzibar
Northern highlands	Arusha and Kilimanjaro
Lake	Tabora, Kigoma, Shinyanga, Kagera, Mwanza, and Mara
Central	Dodoma and Singida
Southern highlands	Iringa, Mbeya, and Rukwa
Southern	Lindi, Mtwara, and Ruvuma

Table 9 Zonal classification: DHS 2004, 2007, and 2010. *Source:* United Republic of Tanzania (2004, 2007, 2010)

Zone	Regions
Western	Tabora, Shinyanga, Kigoma
Northern	Kilimanjaro, Tanga, Arusha, Manyara
Central	Dodoma, Singida
Southern highlands	Mbeya, Iringa, Rukwa
Lake	Kagera, Mwanza, Mara
Eastern	Dar es Salaam, Pwani, Morogoro
Southern	Lindi, Mtwara, Ruvuma
Zanzibar	Unguja North, Unguja South, Town West, Pemba North, Pemba South

Table 10 Zonal classification: DHS 2015. *Source:* United Republic of Tanzania (1991, 1999)

Zone	Regions
Western	Tabora and Kigoma
Northern	Kilimanjaro, Arusha and Tanga
Central	Dodoma, Singida and Manyara
Southern highlands	Iringa, Njombe and Ruvuma
Southern	Lindi and Mtwara
South west highlands	Mbeya, Rukwa and Katavi
Lake	Kagera, Mwanza, Geita, Mara, Simiyu and Shinyanga
Eastern	Dar es Salaam, Pwani and Morogoro
Zanzibar	Unguja North, Unguja South, Town West, Pemba North, Pemba South

Table 11 Quantiles 2004 through 2015—rural areas. *Source:* DHS 2004, 2007, 2010 and 2015

	2004	2007	2010	2015	Change between 2004 and 2015
Quantile 1	7.8	10.3	6.5	7.2	- 0.7
Quantile 2	22.3	23.0	20.1	21.2	- 1.1
Quantile 3	22.5	22.2	24.1	26.1	3.6
Quantile 4	24.0	22.4	24.9	24.7	0.7
Quantile 5	23.3	22.2	24.5	20.8	- 2.6

Table 12 Quantiles 2004 through 2015—urban areas. *Source:* DHS 2004, 2007, 2010 and 2015

	2004	2007	2010	2015	Change between 2004 and 2015
Quantile 1	63.0	65.1	62.7	58.1	- 4.8
Quantile 2	22.7	21.9	25.9	29.6	7.0
Quantile 3	7.1	6.5	5.8	6.3	- 0.8
Quantile 4	4.4	3.9	2.4	2.2	- 2.2
Quantile 5	2.9	2.6	3.3	3.7	0.8

Table 13 Quantiles 2004 through 2015—DSM. *Source:* DHS 2004, 2007, 2010 and 2015

	2004	2007	2010	2015	Change between 2004 and 2015
Quantile 1	91.6	92.8	77.3	83.6	- 8.1
Quantile 2	6.0	5.2	20.9	16.1	10.2
Quantile 3	1.6	1.1	1.3	0.0	- 1.6
Quantile 4	0.3	0.8	0.3	0.0	- 0.3
Quantile 5	0.5	0.0	0.3	0.3	- 0.3

Table 14 Quantiles 2004 and 2015—other regions. *Source:* DHS 2004, 2007, 2010 and 2015

	2004	2007	2010	2015	Change between 2004 and 2015
Quantile 1	17.6	19.0	17.1	18.3	0.7
Quantile 2	23.1	23.5	21.3	24.1	1.0
Quantile 3	19.8	19.6	20.3	21.6	1.8
Quantile 4	20.3	19.2	20.5	19.3	- 1.0
Quantile 5	19.3	18.8	20.9	16.8	- 2.5

Table 15 Changes in the inequality indices between 1991–2004 and 2007–2015 (Individuals 15 + years olds). *Source:* DHS 1991, 1999, 2004, 2007, 2010 and 2015

	Zones	Gender	Rural/urban	Capital/others
Gcov				
1991–2004	0.06	- 0.08	- 0.03	- 0.02
Δ	+	-	-	-
2007–2015	- 0.02	- 0.05	-0.04	0.00
Δ	-	-	-	NC
Ggini				
1991–2004	0.00	- 0.03	0.00	0.00
Δ	NC	-	NC	NC
2007–2015	- 0.07	- 0.02	- 0.01	0.00
Δ	-	-	-	NC

NC no changes

Table 16 Changes in the inequality indices between 1991–2004 and 2007–2015 (Individuals 25 + years olds). *Source:* DHS 1991, 1999, 2004, 2007, 2010 and 2015

	Zones	Gender	Rural/urban	Capital/others
Gcov				
1991–2004	- 0.10	- 0.19	- 0.15	- 0.21
Δ	-	-	-	-
2007–2015	- 0.05	- 0.05	- 0.05	- 0.01
Δ	-	-	-	-
Ggini				
1991–2004	- 0.02	- 0.07	- 0.03	- 0.02
Δ	-	-	-	-
2007–2015	- 0.08	- 0.02	- 0.01	0.00
Δ	-	-	-	-

NC no changes

References

- Arndt, C., Demery, L., McKay, A., & Tarp, F. (2015). Growth and poverty reduction in Tanzania. WIDER Working Paper 2015/051. <https://www.wider.unu.edu/publication/growth-and-poverty-reduction-tanzania>. Accessed 12 Jan 2017.
- Atkinson, A. B., & Lugo, M. (2010). Growth, poverty and distribution in Tanzania. Working paper 10/0831, international growth centre London school of economics and political science.

- Bellù, L. G., & Liberati, P. (2006). *Describing income inequality: Theil index and entropy class indexes*. Rome: FAO.
- Berg, A., & Ostry, J. (2013). Inequality and unsustainable growth: Two sides of the same coin? *International Organisations Research Journal*, 8(4), 77–99.
- Birdsall, N., & Londofio, J. (1997). Asset inequality matters: an assessment of the World Bank approach to poverty reduction. *AEA Papers and Proceedings*, 87(2), 32–37.
- Bush, K. D., & Saltarelli, D. (2000). The two faces of education in ethnic conflict: Towards a peacebuilding education for children. UNICEF. <https://www.unicef-irc.org/publications/pdf/insight4.pdf>. Accessed 12 Jan 2017.
- Christiaensen, L., De Weerd, J., & Kanbur, R. (2017). Secondary towns and poverty reduction in Tanzania. Policy brief 40300. International Growth Centre (IGC).
- Conceição, P., & Bandura, R. (2009). Measuring subjective wellbeing: a summary review of the literature. Working Paper, Office of Development Studies, United Nations Development Programme.
- Cowell, F. A. (2009). Measuring inequality. http://darp.lse.ac.uk/papersDB/Cowell_measuringinequality3.pdf. Accessed 26 Dec 2017.
- Dauids, C., & Maliti, E. (2015). Situational analysis in support of UNDP II. UNDP. <http://erc.undp.org/evaluation/documents/download/9341>. Accessed 12 Jan 2017.
- De Maio, F. (2007). Income inequality measures. *Journal of Epidemiology Community Health*, 61, 849–852.
- Deininger, K., & Olinto, P. (1999). Asset distribution, inequality, and growth. World Bank Policy Research Working Paper 2375. <http://dx.doi.org/10.1596/1813-9450-2375>.
- Deininger, K., & Squire, L. (1998). New ways of looking at old issues: Inequality and growth. *Journal of Development Economics*, 57(2), 259–287.
- Demombynes, G., & Hoogeveen, H. (2007). Growth, inequality and simulated poverty paths for Tanzania, 1992–2002. *Journal of African Economies*, 16(4), 596–628.
- ESRF. (2014). *Tanzania human development report 2014*. Dar es Salaam: ESRF.
- Filmer, D., & Pritchett, L. H. (2001). Estimating wealth effects without expenditure data-or tears: An application to educational enrolments in states of India. *Demography*, 38(1), 115–132.
- Filmer, D., & Scott, K. (2012). Assessing asset indices. *Demography*, 49, 359–392.
- Forum, Policy. (2009). *Growth in Tanzania: Is it reducing poverty?*. Dar es salaam: Policy Forum.
- Green, D. A., & Kesselman, J. (2006). Dimensions of inequality in a just society. In D. A. Green & J. Kesselman (Eds.), *Dimensions of inequality in Canada*. Vancouver: UBC Press.
- Gurr, T. R. (1970). *Why men rebel*. Princeton: Princeton University Press.
- Gwatkin, D. R. (2002). Reducing health inequalities in developing countries. In the Oxford Textbook of Public Health fourth edition. The World Bank: Washington DC.
- Hassine, N. B., & Zeufack, A. (2015). Inequality of outcomes and inequality of opportunity in Tanzania. World Bank Policy Research Working Paper 7260. <https://openknowledge.worldbank.org/handle/10986/21992>. Accessed 12 Jan 2017.
- Jackson, P. (2015). *Handbook of international security and development*. Cheltenham: Edward Elgar Publishing.
- Kenny, C. & Sumner, A. (2011). More money or more development: What have the MDGs achieved? Center for Global Development. Working Paper 278.
- Kim, S. (2008). Spatial Inequality and Economic Development: Theories, Facts, and Policies. World Bank working paper No. 16. http://siteresources.worldbank.org/EXTPREMNET/Resources/489960-1338997241035/Growth_Commission_Working_Paper_16_Spatial_Inequality_Economic_Development_Theories_Facts_Policies.pdf. Accessed 23 Jan 2018.
- Lam, D., Leibbrandt, M., & Finn, A. (2015). Schooling inequality, returns to schooling, and earnings inequality: evidence from Brazil and South Africa. 10th IZA/World Bank conference on employment and development Bonn, Germany 5–6 June 2015.
- Lipsky, M. (1968). Protest as a political resource. *American Political Science Review*, 62(4), 1144–1158.
- Macleod, C. M. & Eisenberg, A. (2006). Normative Dimensions of inequality. In D. A. Green & J. Kesselman (Eds.), *Dimensions of inequality in Canada*.
- Mashindano, O. & Maro, F. (2011) Growth without poverty reduction in Tanzania: Reasons for the mismatch. CPRC Working Paper 207.
- McKay, A. (2002). Defining and measuring inequality. ODI Inequality Briefing, number 1, March 2002.
- McKenzie, D. J. (2004). Measuring inequality with asset indicators. *Journal of Population Economics*, 18(2), 229–260.
- Mesaki, S. (2011). Religion and the state in Tanzania. *Cross-Cultural Communication*, 7(2), 249–259.
- Milanovic, B. (2005). *Worlds apart: Measuring international and global inequality*. Princeton: Princeton University Press.
- Murshed, S. M. (2010). *Explaining civil war: A rational choice approach*. Cheltenham: Edward Elgar.

- Nel, P. (2006). The return of inequality. *Third World Quarterly*, 27(4), 689–706.
- Nissanke, M., & Thorbecke, E. (2006). Channels and policy debate in the globalization–inequality–poverty nexus. *World Development*, 34(8), 1338–1360.
- Nozick, R. (1974). *Anarchy, state, and Utopia*. New York: Basic Books.
- Perotti, R. (1996). Growth, income distribution and democracy: What the data say. *Journal of Economic Growth*, 1(2), 149–187.
- Persson, T., & Tabellini, G. (1994). Is inequality harmful for growth? *American Economic Review*, 84(3), 600–621.
- Piketty, T. (2014). *Capital in the twenty-first century*. Belknap: Cambridge.
- Ravallion, M. (1997). Can high-inequality developing countries escape absolute poverty? *Economic Letters*, 56(1), 51–57.
- Ravallion, M. (2005). Inequality is bad for the poor. World Bank Policy Research Working Paper 3677, <http://dx.doi.org/10.1596/1813-9450-3677>. Accessed 12 Jan 2017.
- Rawls, J. (1971). *A theory of justice*. Cambridge: Harvard University Press.
- Sekkat, K. (2017). Urban concentration and poverty in developing countries. *Growth and Change*, 48(3), 435–458.
- Stewart, F. (2000). Crisis prevention: Tackling horizontal inequalities. *Oxford Development Studies*, 28(3), 245–262.
- Stewart, F., Brown, G., & Mancini, L. (2010). Monitoring and measuring horizontal inequalities. DFID. <https://www.gov.uk/dfid-research-outputs/monitoring-and-measuring-horizontal-inequalities>. Accessed 12 Jan 2017.
- Sumra, S. & Rajani, R. (2007). Secondary education in Tanzania: Key policy challenges. HakiElimu Working Papers.
- Tanzania Commission for Universities. (2016). List of university institutions in Tanzania as of 22nd February, 2016 (<http://www.tcu.go.tz/images/documents/RegisteredUniversity.pdf>).
- Thorbecke, E., & Charumilind, C. (2002). Economic inequality and its socioeconomic impact. *World Development*, 30(9), 1477–1495.
- UNICEF. (2015). *Does horizontal education inequality lead to violent conflict? A global analysis*. New York: UNICEF.
- United Nations. (2015). Concepts of inequality development Issues No. 1. Department of Economic and Social Affairs. http://www.un.org/en/development/desa/policy/wess/wess_dev_issues/dsp_policy_01.pdf.
- United Republic of Tanzania. (1991). *Tanzania demographic and health survey 1991*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania. (1999). *Tanzania demographic and health survey 1999*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania. (2004). *Tanzania demographic and health survey 2004*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania. (2005). *Poverty and Human Development Report 2005*. Dar es Salaam: Ministry of Planning, Economy and Empowerment.
- United Republic of Tanzania. (2007). *Tanzania demographic and health survey 2007*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania. (2010). *Tanzania demographic and health survey 2010*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania. (2012). *Household budget survey*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania. (2013). *Pre-primary, primary and secondary education statistics in brief 2013*. Dar es Salaam: Prime Ministers Office Regional Administration and Local Government.
- United Republic of Tanzania. (2015). *Tanzania demographic and health survey 2015*. Dar es Salaam: National Bureau of Statistics.
- URT. (2009). *Economic survey*. Dar es Salaam: Ministry of Finance and Planning.
- URT. (2010). *Economic survey*. Dar es Salaam: Ministry of Finance and Planning.
- URT. (2015). *Economic survey*. Dar es Salaam: Ministry of Finance and Planning.
- URT. (2016). *Economic survey*. Dar es Salaam: Ministry of Finance and Planning.
- WHO. (2013). *Handbook on health inequality monitoring with a special focus on low- and middle-income countries*. Geneva: WHO.
- Williams, R., & Doessel, D. (2006). Measuring inequality: Tools and illustration. *International Journal for Equity in Health*, 5(5), 1–8.
- Williamson, J. G. (1965). Regional inequality and the process of national development: A description of the patterns. *Economic Development and Cultural Change*, 13(4), 1–84.

- Wittenberg, M. (2009). Weighing the value of asset proxies: The case of the body mass index in South Africa. Working Paper 39, SALDRU, University of Cape Town, Cape Town, 2009. Available at <http://www.opensaldru.uct.ac.za/handle/11090/16>.
- Wittenberg, M. (2011). Estimating expenditure impacts without expenditure data using asset proxies. *Economics Letters*, 110, 122–125.
- Wittenberg, M., & Leibbrandt, M. (2017). Measuring inequality by asset indices: A general approach with application to south Africa. Review of Income and Wealth. Working Paper No.16.
- World Bank. (2007). *Tanzania sustaining and sharing economic growth. Country economic memorandum and poverty assessment*. Washington, DC: World Bank.
- World Bank (2014a). How Tanzania plans to achieve Big Results Now in Education. <http://www.worldbank.org/en/news/feature/2014/07/10/how-tanzania-plans-to-achieve-big-reforms-now-in-education>.
- World Bank. (2014b). *Program appraisal document on a proposed IDA credit to Tanzania for the Big Results Now in education program*. Washington, DC: World Bank.
- World Bank. (2014c). Productive jobs wanted. country economic Memorandum. World Bank. Washington.
- World Bank. (2015). *Tanzania mainland poverty assessment*. Washington, DC: World Bank.
- World Bank. (2016). World Development Indicators 2016. World Bank. http://info.worldbank.org/etools/docs/library/103081/case2003_tanzania_budget.pdf. Accessed 25 Aug 2016.
- World Bank, AERC & AfDB. (2012). *Service delivery indicators: Education and Health*. Washington: World Bank.
- World Health Organization (2013). *Handbook on health inequality monitoring*. Geneva: World Health Organization.