Poverty Changes in Tanzania:
An Assessment of Income Growth, Inequality
and Population Shifts in Kagera, 1991–2010

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Abstract

This study decomposes the Kagera headcount poverty index into effects of income growth, income inequality, and population shifts. In the literature, the decomposition of poverty into growth and inequality components—which began with Kuznets (1955)—is continuing, with the results still being inconclusive. Later analyses have also incorporated the effects of population shifts into the poverty dynamics, as migrants ordinarily benefit from new avenues of reducing poverty, which however are not without negative effects. Using the Kagera Health and Development Survey (KDHS) data, the paper uses Son's (2003) approach to decompose poverty in Kagera Region into income growth, inequality, and population shifts. The results show that growth leads to poverty reduction; population shifts tend to have mixed results depending on how the data are partitioned; whereas inequality effects were found to change with the base year. The findings imply that policies geared at reducing poverty should not be divorced from location-specific situations.

Keywords: poverty dynamics, decomposition, growth, Kagera

Introduction

This paper decomposes the Kagera headcount poverty index into growth, inequality, and population shift-effects. Kagera is a rural region in North-western Tanzania, sharing borders with Rwanda, Burundi, and Uganda. Up to the mid-1970s it was among the economically well-performing regions of Tanzania. However, internal and external shocks have adversely affected the region's economy from the late 1970s (URT, 1998). These shocks include the Kagera war;[1] high rate and spread of HIV/AIDS;[2] a fall in coffee prices, the main cash crop in the region; a plunge in banana production, the main staple due to banana weevil infestations and other diseases; and an influx of refugees from Burundi, Rwanda and the Democratic Republic of Congo. These shocks have extended beyond the study period, as the region was struck by an earthquake of the magnitude of 5.7 on a Richter scale in September 2016, which left thousands of people homeless, hundreds of people injured or dead, and soil in many areas eroded. Over time, these region-specific shocks have contributed to plunging the

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[1]The war between Uganda (under Idi Amin's) and the United Republic of Tanzania whereby, the West Lake Region (later named Kagera Region) was the battlefield following Idi Amin's unprovocative invasion of Tanzania and annexing a part of the then West Lake Region beyond the Kagera River.

[2] The first case of HIV/AIDS in Tanzania was diagnosed in Kagera Region in 1983. Consequently, in the 1980s, the region had the highest prevalence rate among all the regions of Tanzania.

region into deep poverty. In spite of the abundance of natural resources—such as tin, nickel, gold, and different types of fisheries and forestry—the region's rank in terms of output growth among the regions of Tanzania has been worsening with time. Pantaleo (2016) has contended that as these factors continued to affect the productive capacity of the region, many of the affected households became more vulnerable to poverty. Hence, by 2004 the region was categorized as among those with slow growth, and ranked among the poorest regions in Tanzania at 16th position out of 22 regions (Mkenda et al., 2004), and 18th position out of 21 regions in human development index (HDI) ranks by 2012 (URT & UNDP, 2014).

Among the factors argued to contribute to poverty changes, the most common are income growth and inequality, which have continued over the years to spur initiatives to decompose poverty. Kuznets (1955) sought to explain the relationship in economic development between inequality and income, basing on factors associated with the shift of resources from agriculture to industry. Whereas his focus was on the urban-rural dichotomy, he incorporated also the analysis of distributional changes (Arnand & Kanbur, 1985).

Kuznets' (1955) seminal work stirred empirical research with regard to the relationship between growth and poverty. Kakwani and Subbarao (1990) found the correlation between growth and poverty reduction to be positive, which has been corroborated by later studies (e.g., Ravallion & Datt, 1996; Datt & Ravallion, 2002; Dollar & Kraay, 2002; and Agrawal, 2008). In other studies, high growth was found to have resulted into poverty reduction, but with increased inequality (Ravallion, 2001; Deininger & Okidi, 2005). Yet in others, the relationship between growth and poverty was found to be inconclusive (e.g., Brock & Durlauf, 2000; Bourguignon, 2000). Some studies have instead decomposed poverty into growth and redistribution effects (Ravallion & Huppi, 1991; Datt & Ravallion, 1992; Tsui, 1996; Assadzadeh & Paul, 2004).

Some studies on Tanzania with regard to poverty that have analyzed aspects of growth and inequality include that of Lugoe (2003) who used time series data on Tanzania to examine distribution-corrected economic growth, and found that it reduces poverty. Atkinson and Lugo (2010), using the Tanzania Household Budget Survey (THBS) of 2001 and 2007 and national accounts data, found that poverty reduction is accountable to the pace of growth than the resulting outcome. Also, Mkenda et al. (2010) used the THBS of 2001 and 2007 and national income data to explain why Tanzania's sustained high growth over the years has not succeeded at reducing poverty and eliminate the inequality aspects. These studies, being pan-territorial, did not examine the contribution to poverty of migration or population shifts in either rural or urban settings.

With regard to Kagera, the shocks that have afflicted the region over time have caused the migration of some people to other areas as a coping mechanism (Beegle et al., 2011). In addition, the influx of migrants into and out of the region has made the economic conditions in the region worse (Beegle et al., 2011). On the other hand,

De Weerdt (2010) has argued that those who emigrated to Kagera in the early years faced difficulties because they did not have initial endowments to bank on. However, with time, they picked up economically through cooperating well with the indigenous people in their new communities. Yet in Tanzania, the available literature shows that the role of population shifts in the dynamics of poverty has not been given sufficient empirical attention to date.

Thus, reflecting on the specific situation that has afflicted the Kagera region, this paper has analysed poverty changes over time in Kagera by decomposing the poverty into effects of income growth, inequality, and population shifts. The findings show that growth led to poverty reduction, and that the effects of population shifts were mixed, depending on how the data were partitioned. Inequality effects were found to change with the base year. Hence, even with the inconclusiveness on the effects of migration, the findings tend to imply that policies geared at reducing poverty should attempt to address location-specific situations rather than being pan-territorial.

Literature Review

Previous studies on Tanzania that decomposed poverty changes adopted the Datt and Ravallion (1992) approach[3] (see, e.g., Kirama, 2015; Hoogeveen et al., 2008; Demombynes & Hoogeveen, 2004). The Datt and Ravallion (1992) approach decomposes poverty reduction into growth and redistribution components and the residual. The growth component is defined as the change in poverty due to change in mean income, holding the Lorenz curve constant; whereas the redistribution component is defined as the change in poverty due to the Lorenz curve, holding the mean income constant. The residual is the difference between the growth components evaluated at the initial and terminal mean incomes; or the difference of the redistribution components, evaluated similarly. The residual vanishes if the mean income and/or the Lorenz curve remain unchanged over the decomposition period.

The Datt and Ravallion's (1992) approach however, has two limitations (Shimeles, 2005). One, the growth and redistribution effects are not symmetric with respect to the base and final year. Two, the decomposition is not exact since it contains the residual term. However, the main deficiency for not adopting the approach in this study is that it does not account for migration effects.

Kuznet (1955) assumed that all rural people are homogeneous (Arnand & Kanbur, 1985), such that migration will not be a selective process. However, in most situations, Kagera inclusive, the rural population is heterogeneous. This heterogeneity implies that, over time, people will not migrate 'representatively' to urban areas. Poverty dynamics, particularly in the rural setting, dictate that people will likely migrate internally or to urban areas as a coping mechanism (Beegle et al., 2011). Thus, this study analyses the growth and inequality dynamics of poverty as examined in previous poverty studies on Kagera, but incorporates in the analysis the migration effects as well.

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[3]Other approaches for decomposing poverty change into growth and redistribution effects include those employed by Kakwani and Subbarao (1990), Ravallion and Huppi (1991), and Tsui (1996).

Empirical Model

The paper uses Son's (2003) approach, which decomposes changes in poverty incidence over time into growth, inequality, and migration components, as used by Mulenga and Van Campenhout (2008) on Zambia.[4] The poverty index used is additively decomposable and valid for the entire class of additively separable poverty measures, with no residual term (Mulenga & Van Campenhout, 2008). For each classification, Son's (2003) decomposition shows that change in the incidence of poverty can be broken down into four elements that:

(a) Reflects the shifts in population between segments that have different degrees of poverty;
(b) Measures the impact of the overall growth in income in the economy;
(c) Takes into account the growth rates that different segments experienced; and
(d) Reflects changes in the distribution of income within each segment.

In decomposing the poverty changes, Son (2003) expresses aggregate poverty, P_t, as the population-weighted mean of sub-group poverty measures:

$$P_t = \sum_i f_{it}\, P_{it} \qquad (1)$$

where t denotes time, and i stands for a mutually exclusive sub-group in society, f_{it} is the population share of sub-group i at time t, P_t is aggregate poverty at time t, and P_{it} is poverty at time t in sub-group i.

Changes in aggregate poverty over time is then decomposed into two categories: changes reflecting within-group poverty, ΔP_{it}; and changes reflecting population shares between groups, Δf_{it}, , as shown in equation (2):

$$\Delta P_t = \frac{1}{2}\left[\sum_i f_{it-1}(\Delta P_{it}) + \sum_i f_{it}(\Delta P_{it})\right] + \frac{1}{2}\left[\sum_i P_{it-1}(\Delta f_{it}) + \sum_i P_{it}(\Delta f_{it})\right] \qquad (2)$$

Then, the within-group change in poverty is decomposed further into an income effect and an inequality effect for each sub-group i:

$$\Delta P_{it} = (\Delta P_{it})_M + (\Delta P_{it})_I \qquad (3)$$

the first term on the right-hand side of the equation is the growth effect, which measures the change in poverty within group i that results from growth in average (mean) wealth over time, keeping inequality constant. The second term is the inequality effect, which measures changes in poverty due to changes in the distribution of wealth, with mean income remaining constant.

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[4]Whereas Mulenga and Van Campenhout (2008) applied the method using Household Budget Survey data for Zambia, our study uses household panel data for Kagera Region. Thus, Mulenga and Van Campenhout's (2008) study presents poverty trends, since the data used give inter-temporal changes in aggregate poverty. However, our study uses data that trace specific households' variables over time to analyses poverty dynamics.

Combining equations (2) and (3), and expressing changes in aggregate poverty relative to initial poverty, yields the following growth effect shown in equation (4):

$$\frac{\Delta P_t}{P_{t-1}} = \sum_i \frac{0.5(f_{it} + f_{it-1})(\Delta P_{it})_M}{P_{t-1}} + \sum_i \frac{0.5(f_{it} + f_{it-1})(\Delta P_{it})_I}{P_{t-1}} + \sum_i \frac{0.5(P_{it} + P_{it-1})(\Delta f_{it})}{P_{t-1}} \qquad (4)$$

Equation (4) is a decomposition of aggregate changes in poverty into three components: (i) the sum of growth effects over the sub-groups (the first term); (ii) sum of inequality effects over the sub-groups (the second term); and (iii) the population shift effect, composed of the sum of changes in aggregate poverty due to changes in the population shares of the different sub-groups.

The growth effect in equation (4) is further decomposed into overall growth effect and sub-groups growth effect as follows:

$$\sum_i \frac{0.5(f_{it} + f_{it-1})(\Delta P_{it})_M}{P_{t-1}} = \sum_i \frac{0.5(f_{it} + f_{it-1})(\Delta P_{it})_{OG}}{P_{t-1}} + \sum_i \frac{0.5(f_{it} + f_{it-1})(\Delta P_{it})_{SG}}{P_{t-1}} \qquad (5)$$

where,

$$(\Delta P_{it})_{OG} = 0.5 \begin{bmatrix} P(z, \mu_{it}(1+g), L_{it-1}(p)) - P(z, \mu_{it-1}, L_{it-1}(p)) \\ +P(z, \mu_{it}(1+g), L_{it}(p)) - P(z, \mu_{it}, L_{it}(p)) \end{bmatrix} \qquad (6)$$

and

$$(\Delta P_{it})_{SG} = 0.5 \begin{bmatrix} P(z, \mu_{it}, L_{it-1}(p)) - P(z, \mu_{it-1}(1+g), L_{it-1}(p)) \\ +P(z, \mu_{it}, L_{it}(p)) - P(z, \mu_{it-1}(1+g), L_{it}(p)) \end{bmatrix} \qquad (7)$$

where g is the average growth rate of the welfare of the entire population, and $P(.)$ is a poverty measure that is determined by the poverty line (z), mean income (μ), and the Lorenz curve (L).

Following the above decomposition of the growth effect, the final decomposition of aggregate changes in poverty is given as:

$$\frac{\Delta P_t}{P_{t-1}} = \sum_i \frac{0.5(f_{it} + f_{it-1})(\Delta P_{it})_{OG}}{P_{t-1}} + \sum_i \frac{0.5(f_{it} + f_{it-1})(\Delta P_{it})_{SG}}{P_{t-1}} + \sum_i \frac{0.5(f_{it} + f_{it-1})(\Delta P_{it})_I}{P_{t-1}} + \sum_i \frac{0.5(P_{it} + P_{it-1})(\Delta f_{it})}{P_{t-1}} \qquad (8)$$

= overall growth effect + sub-group growth effect + inequality effect + population shift effect.

Equation (8) states that a change in aggregate poverty is decomposable into four components. The first component is the overall growth effect, assuming inequality remains unchanged. This component quantifies the change in poverty that would occur if the living standards of each sub-group[5] were to change at the average aggregate rate. The second term takes into account the growth rates among sub-groups, that is, how growth rates may vary from one sub-group to the other, thereby capturing sub-group's heterogeneity in growth. The third term reflects changes in the distribution of wealth within different groups, which reflects the impact of changes in the distribution of standards of living within different sub-groups. The last term constitutes changes in poverty accounted to changes in the population shares of different sub-groups. It captures the effects of migration of population between groups in the total poverty incidence.

According to Son (2003), the directions of the changes are as follows:

- If economic growth is positive, the overall growth effect will always be negative.
- A sub-group growth effect can be either positive or negative, depending on whether the difference in growth rates of different groups contributes, respectively, to increase or decrease in total poverty.
- The inequality effect also can be either positive or negative. If positive, it indicates that a change in inequality within a sub-group has contributed to an increase in the total poverty incidence, and vice versa, for a decrease.
- The population effect is taken to be pro-poor if the respective term is negative as it leads to a reduction in poverty, e.g., when migration is from poor to richer areas. The opposite case is also possible.

To decompose the Son (2003) index, the headcount ratio is used to track changes in the proportion of a population living in poverty. Hence, it is mainly useful in designing policies to reduce the number of people living in poverty.

Moreover, this paper has used the proposed international poverty line of USD 1.25 converted to TZS using the obtaining exchange rates in the years of the study.[6] This study used the World Bank international poverty line in a response to criticisms raised by people interviewed in Kagerain et al. (2009). The interviewees claimed that national poverty lines are too low, such that they tend to give the wrong impression that many people are relatively well-off, whereas they perceive themselves as being very poor[7]. These perceptions are reflected, for example, in the following statement:

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[5]These sub-groups can be by area of residence, sex of the household head, household size, and sector of employment. This paper uses rural-urban and district level sub-groups. The poverty dynamics, particularly in the rural setting, dictate that people will likely migrate internally or to urban areas or across districts as a coping mechanism; thus, the sub-groups will help to indicate how the effects differs around sub-groups.

[6]The poverty line used was roughly USD1 per day per capita. In 2008, the World Bank, based on Ravallion et al. (2008), came up with a figure of USD1.25 (revised largely due to inflation) at the 2005 (PPP).

[7]Narayan *et al.* (2009) uses peoples' own understanding of freedom, equality, empowerment, aspirations and how they define poverty to develop more effective strategies to reduce poverty. They conducted 21 studies from different countries, with two studies each in the Philippines, Sri Lanka and Tanzania.

*When you take a person as not being poor [given that his or her income is just above the official poverty line], prepare a prison cell for him or her as well, because after a few hours, she or he will start stealing [in order to survive] (*Rephrased comment from the Discussion Group, Chubaka, Kagera, Tanzania from Narayan et al. (2009: 13).

Even in empirical studies, the international poverty line was found to be more appropriate than the official poverty line. For example, Narayan et al. (2009) estimated the community poverty line (CPL) that resulted in a much higher percentage of the poor than which would result from applying 'a dollar a day' measure, was often used internationally as the poverty line. In spite of this higher CPL estimate, participants in the focus groups, all non-professionals, had perceptions that were often closer to 'a dollar a day' standard, which justifies the appropriateness of the international poverty line. Additionally, poverty measures based on the international poverty line attempt to hold constant the real value of poverty lines across countries, thereby facilitating comparisons over time.

Data
The study uses the Kagera Health and Development Survey (KHDS) data set. The KHDS delves into the long-run wealth and health dynamics of households and individuals within Kagera Region, Tanzania. The data were collected by the World Bank in collaboration with the Economic Development Initiative (EDI), University of Dar es Salaam and Muhimbili University of Health and Allied Science. The collection of this longitudinal dataset started with a first wave in 1991, and the last wave (the sixth wave) was collected in 2010. Earlier waves of the survey include the four waves, collected from 1991-1994 (namely, KHDS 91-94), and the fifth wave was in 2004. Originally, the waves adopted the World Bank's Living Standards Measurement Study (LSMS) questionnaire. However, in later waves some questions and sections in the questionnaire was slightly modified to accommodate the changing analytical demands for the panel data. These demands may not have compromised comparability because the key questions used in this paper to create the variables used in the analysis remained the same, and also, the contact rate of baseline households in later waves at 93% was very high to justify comparability.

The dataset contains information on household characteristics, income and consumption, health and education, migration, deaths and community development. It also has associated datasets on asset and crop prices, distance to service centres, and rainfall pattern.

The KHDS 91-94 household sample was drawn in two stages, with stratification based on geography in the first stage, and mortality risk in both stages, which led into the selection of 51 communities as primary sampling units (PSUs) (also referred to as clusters) (World Bank, 2004). The second stage (within enumeration areas) used a stratified random sample, in which households that expected to experience an adult death due to either living in communities suffering from an HIV epidemic, or having a history of prior adult death or illness, were over-sampled. After the two stages, 816 households in 51 enumeration areas were drawn.

For the 2004 and 2010 surveys, 6,353 people who were household members in any wave of the KHDS 91-94 were re-interviewed (De Weerdt et al. 2010). The household questionnaire was administered to households in which previous household members (PHHMs) lived. The longevity of the KHDS panel makes it difficult to define a household; yet, attempts were made to consider re-contact rates in terms of households. A re-contact is defined as having interviewed at least one person from the household, and excluding households in which all previous members were deceased (17 households and 27 respondents). The KHDS 2004 re-contacted 93 percent of the baseline households, whereas the KHDS 2010 re-contacted 92 percent of the households.

Table 1 provides the KHDS 2010 re-contact rates by location. According to De Weerdt et al. (2010), more than 50 percent of the re-interviewed panel respondents were located in the same community as in the KHDS 91-94; nearly 14 percent were found in other regions of Tanzania; and about 1 percent of the interviewed panel respondents were located outside the country, particularly in Uganda.

Table 1: KHDS 2010 Re-Contact Rates by Location

	Number	Location	%
Baseline sample	6, 353		
Re-interviewed	4, 336		
		Same community	52
		Nearby village	9
		Elsewhere in Kagera	24
		Other region	14
		Uganda[a]	1
Untraced	742		
		Kagera	53
		Dar es Salaam	9
		Mwanza	9
		Other region	10
		Other country[b]	8
		Not known	11
Deceased	1, 275		

Source: De Weerdt *et al.* (2010)

Notes: Location for untraced respondents is reported by other household members from the baseline survey that was successfully located, interviewed, and able to provide location information on the respondent. In some cases, this information comes from other relatives or neighbours residing in the baseline communities.

    a. KHDS 2010 tracked international migrants in Uganda only.

    b. Countries to which the 58 untraced respondents had moved included Burundi, Denmark, Kenya, Norway, Rwanda, South-Africa, Sweden, UK and USA.

This paper used four of the six KHDS waves, namely, Wave 1, Wave 3, Wave 5 and Wave 6. The choice of the waves aimed at ensuring that both the most current information (Wave 6) and baseline information (Wave 1) was reflected in the analysis. For the other two waves, Wave 3 was randomly selected from the remaining of the KHDS 91-94, and Wave 5 was for year 2004. Hence, the selection represents the whole spectrum of the panel data set.

Empirical Results and Discussion

The used Son's (2003) approach involves comparing the magnitude of the decomposed components of growth, inequality, and population shifts for a pair of waves (years) in turns. The results for each pair of waves are presented in Tables 2 and 3 for urban-rural comparison and district comparisons, respectively.

Overall Growth Effects

The overall growth effects across all pairs of waves are consistently negative for the rural and urban areas of Kagera region, as shown in Table 2 and for all the districts in the region (Table 3). The negative growth effects indicate that economic growth resulted in the reduction of poverty within the Kagera region between each pair of the compared waves. These results are consistent with the trend of the regional GDP, which rose consistently in the twenty-year period from 1990 to 2010 (Appendix 1). However, the positive GDP trend notwithstanding, the region's rank in terms of GDP growth among the regions of Tanzania worsened during the period, which indicates that economic growth in Kagera region failed to keep pace with the growths in most of other regions of Tanzania.

Table 2: Comparison of Kagera Region (Headcount) Poverty Decomposition between Rural and Urban, 1991-2010

	Urban	Rural	Urban	Rural
	1991-1993		**1991- 2004**	
Overall Growth Effects	-0.0001	-0.0055	-0.0001	-0.0056
Sub-group Growth Effects	0.0668	0.0672	0.0048	0.0199
Inequality Effects	0.0254	0.0225	0.0034	0.0055
Population Shifts Effects	3.1455	0.0543	1.4343	0.0495
	1991-2010		**1993-2004**	
Overall Growth Effects	-0.0003	-0.0054	-0.0006	-0.0041
Sub-group Growth Effects	0.0018	0.0157	0.0064	0.0012
Inequality Effects	0.0034	0.0039	0.0005	-0.0001
Population Shifts Effects	3.3373	-0.2656	2.6037	-0.3898
	1993-2010		**2004-2010**	
Overall Growth Effects	-0.0005	-0.0056	-0.0001	-0.0058
Sub-group Growth Effects	0.0002	0.0014	0.0005	0.0048
Inequality Effects	0.0000	-0.0001	0.0003	-0.0001
Population Shifts Effects	1.1965	-0.0539	2.3062	-0.1005

Source: Authors' own computations.

Sub-groups Effects

The findings show that the sub-group growth effects across all pairs of waves were positive for both the rural and the urban areas of Kagera region (Table 2). As well, the effects were positive for all the districts in the region (Table 3). The positive sub-groups effects indicate that the differences in growth between the rural and the urban sub-groups led to increase in poverty in the period 1990-2010.

**Table 3: Kagera Region Poverty Decomposition Effects
by District, 1991-2010 (Headcount)**

Waves/District	Overall Growth Effects	Sub-group Growth Effects	Inequality Effects	Population Shifts Effects
1991-1993				
Biharamulo	-0.0004	0.0873	0.0304	6.5318
Bukoba Rural RRRRurakRural	-0.0004	0.0520	0.0188	3.7222
Bukoba Urban	-0.0001	0.0668	0.0254	3.1455
Karagwe	-0.0004	0.0435	0.0169	2.7495
Muleba	-0.0006	0.0626	0.0223	4.5777
Ngara	-0.0039	0.1514	0.0535	8.7104
1991-2004				
Biharamulo	-0.0005	0.0250	0.0089	3.0883
Bukoba Rural	-0.0005	0.0196	0.0072	1.1944
Bukoba Urban	-0.0001	0.0048	0.0034	1.4344
Karagwe	-0.0001	0.0276	0.0110	1.0873
Muleba	-0.0006	0.0033	0.0013	1.2492
Ngara	-0.0038	0.0263	0.0084	2.8474
1991-2010				
Biharamulo	-0.0004	0.0044	0.0015	1.9787
Bukoba Rural	-0.0005	0.0191	0.0073	1.1572
Bukoba Urban	-0.0001	0.0032	0.0025	1.8159
Karagwe	-0.0004	0.0001	0.0002	0.7183
Muleba	-0.0005	0.0114	0.0034	2.0649
Ngara	-0.0031	0.0227	0.0060	1.9926
1993-2004				
Biharamulo	-0.0013	0.0018	0.0000	0.8841
Bukoba Rural	-0.0018	0.0016	-3.873e-08	0.4484
Bukoba Urban	-0.0002	0.0004	0.0000	0.4135
Karagwe	-0.0007	0.0023	0.0001	0.2407
Muleba	-0.0009	0.00004	-0.00002	0.4581
Ngara	-0.0012	0.0019	0.00002	0.9071
1993-2010				
Biharamulo	-0.0011	0.0004	-0.00002	0.5815
Bukoba Rural	-0.0018	0.0017	0.0000	0.4409
Bukoba Urban	-0.0003	0.0029	0.0001	0.5331
Karagwe	-0.0006	0.0000	-0.00002	0.1453
Muleba	-0.0007	0.0010	0.0000	0.3958
Ngara	-0.0009	0.0020	0.00003	0.5174
2004-2010				
Biharamulo	-0.0011	0.0014	0.00005	0.9812
Bukoba Rural	-0.0023	0.0058	0.0004	0.5703
Bukoba Urban	-0.0001	0.0009	0.0002	1.0957
Karagwe	-0.0013	0.00002	-0.0001	0.1995
Muleba	-0.0001	0.0036	0.0003	0.9119
Ngara	-0.0006	0.0069	0.0006	0.8788

   Source: Authors' computations

These results are consistent with Beegle et al. (2011) for the country as a whole, who found that in the period 1994-2004, most of the progress in poverty reduction in Tanzania was only in the urban areas, as growth was not sufficiently broad-based to result in rapid poverty reduction.

Inequality Effects
With 1991 as the base year, changes in inequality in both rural and the urban households in Kagera are shown to have contributed to an increase in total poverty (Table 2). However, with the change in the base year to 1993 (wave 3) or 2004 (wave 5), the results show that changes in inequality contributed to a decrease in poverty only in rural areas (Table 2).

The decrease in poverty only in the rural areas implies that the percentage change in consumption (a proxy for income) was more rapid in the rural areas than in the urban areas.[8] This result may be accounted to the used sample, for which the poverty line for 2004 and 2010 resulting from the consumption data for both the rural and urban areas in Kagera Region was above the median consumption aggregate. When a poverty line is above median expenditure, it implies that resources are distributed from better-off households to worse-off ones. Such distribution could result in a larger number of better-off households falling below a poverty line than the number of worse-off households being lifted above it, thereby causing headcount to increase.

Alternatively, the above results could arise from issues that may cause the Kuznet Hypothesis (KH) to fail (Ravallion, 2005). With migrants moving into different sectors in urban areas, the poverty measures would be heavily influenced by differences in the growth patterns across sectors in the economy. Additionally, the results could be attributed to the negative effects of urbanization: through what Christiansen et al. (2013) have called 'urbanization of poverty'.[9] On account of changes in outcomes when there are changes in the base year, these results are consistent with Mkenda et al. (2010), who found that there is no direct relationship between inequality and poverty reduction. As well, the results are close to Datt and Ravallion's (1992) findings with respect to rural areas, even though they are different for urban areas.

As for the partitioning by districts, the results on inequality effects are negative for Bukoba Urban and Muleba districts between Wave 3 and Wave 5, i.e., between 1993 and 2004, which indicates a reduction of poverty in the two districts between these years. These results are consistent with a reduction in the Gini coefficients for the two districts, as shown in Figure 1. However, the opposite is the case

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[8] It is theoretically known that an increase in the consumption measure may result in poverty reduction (Naschold, 2002)

[9] Christiansen et al. (2013) indicate that a larger share of the poor appears indeed to be living in urban areas due congestion effects hindering growth and the negative externalities from geographically concentrated poverty (such as violence) as well as the irreversibility of urban migration preventing the poor from returning to the rural areas, locking them in their new informal settings.

between Wave 3 and Wave 6, i.e., between 1993 and 2010 for these two districts, whereby inequality changes indicate to have resulted in increasing poverty. For the Biharamulo and Karagwe districts, the results on inequality effects show that poverty decreased between 1993 and 2010. Furthermore, for only Karagwe district, inequality effects show poverty to have decreased between Wave 5 and Wave 6, i.e., in the period 2004 to 2010.
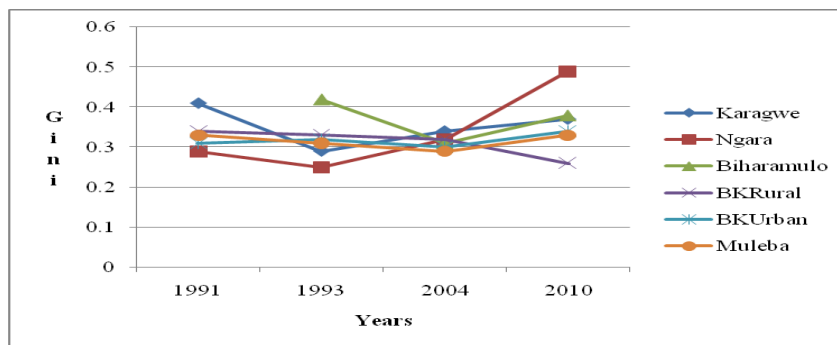

Figure 1: Trends of Gini Coefficients by Districts, KHDS Data – 1991-2010
Source: Authors' Computation

Karagwe's exceptional poverty reduction response to inequality changes relative to other districts in the region may be accounted to the following reason. Several shocks that affected the region between 1994 and 2004 including the plunge of coffee prices,[10] the El-Nino effects in 1997 and 1998, various crop diseases that affected banana and cassava, such as "*batobato*" and pests[11], and the loss in soil fertility had little damage on Karagwe (De Weerdt, 2010). Notably, Karagwe experienced positive net migration from other districts of the region due to the fertility of the land. Thus, the high productive capacity of the district is likely to have enhanced production and growth, thereby leading to poverty reduction.[12]

The results are comparable to Datt and Ravallion (1992), who found negative redistribution effects (i.e., poverty reducing), using the consumption aggregates with consumer durables for the base year to the last year of their study period, for base year to immediate year, and for any two consecutive periods.

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[10]Karagwe had some leeway by smuggling coffee into Uganda, where coffee prices were at least favourable; whereas Biharamulo, for example, did not depend much on perennial crops such as coffee and banana, to the extent of having long-term effects.

[11]One of the authors had the opportunity of living for some time in Bukoba Rural district and witnessed the dearth of the traditional type of banana plants due to infestations by banana weevils and other diseases. The peasants had no option but to uproot the traditional banana plants and replace them with other types, which were unpopular in the market. As well, he witnessed the uprooting of coffee trees due to the plummeting of coffee prices. Recently, the young people have chosen to engage themselves in tree cultivation, such as soft wood.

[12]This claim should be interpreted cautiously, given that in some situations there is no direct relationship between inequality and poverty reduction (see, Mkenda et al., 2010).

Effects of Population Shifts (Migration Effects)

The results with regard to the effects of population shifts (migration effects) was negative for rural households for the 1991-2010 decomposition, and between waves when the base years were 1993 and 2004 (Table 2). These findings indicate that in those years the population shift within the rural areas was pro-poor for the rural households. With 1991 as the base year, there is no poverty reduction effect for migrating households. These results relate closely to Beegle et al. (2011) who show that, for the 1991 panel households, there was no difference in both consumption and poverty between those who stayed in the same community and those who moved elsewhere. However, Du et al. (2005) found the overall impact of migration on poverty reduction to be positive but modest.[13] For urban households, this study found the migration effects to be positive (Tables 2 and 3), which indicates that migration effects is not pro-poor for urban households. These results imply that there is a tendency for the net movement of population to shift from urban settings that are richer in aggregate, to relatively poor rural settings. This is contrary to theory. However, in practice, those who migrate from rural areas to small towns in the hinterland do not uproot completely their rural roots. If migration fails to bear the expected fruits, the only viable option is to return to the villages.[14]

The results with respect to the rural-urban partitioning are ambiguous and inconclusive, especially when the gap between the baseline year and the considered year is small. As for the distinction of districts between urban and rural ones, the population shifts effects are all positive, which indicates that for specific rural districts, the results do not show migration to be pro-poor, in contrast to the results for the rural setting for the whole region for the 1991-2010 period. These results imply the existence of bias as a result of aggregating the units of analysis. Alternatively, such results may be due to limited population movement beyond the households' administrative districts, thereby making it difficult to trace out inter-district movements. Using the same data set, Beegle et al. (2011) found that only 32 percent of the sample households moved beyond their districts of origin.

The result imply that the distributional changes of the wealth indicators are significant in Kagera Region when considering between rural-urban movements vis-à-vis between district movements. This calls for a critical analysis of individual effects on the impact of migration in the region.

Conclusion

This paper has used Son's (2003) approach to decompose poverty (headcount) in Kagera region, Tanzania, into overall growth effects, sub-group growth effects, inequality effects, and population shifts (migration) effects for the period 1991 to 2010.

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[13] This is because most poor people do not migrate.

[14] Beegle et al. (2011) show that by 2004, about 51 percent of households had experienced some movement from their original villages, with only few households moving to Bukoba Urban and outside the region. The movement was within the rural areas, which makes it difficult to ascertain whether it was from rich to poor settings, or vice versa. Moreover, people who fail to sustain a living in urban areas may easily get land resources for agricultural and other activities as a coping mechanism in rural areas.

The study found mixed results, depending on the type of partitioning considered. The overarching specific objective was to examine the migration effects component of the poverty decomposition in Kagera region. To this effect, the study found migration effects not being pro-poor in most of the settings, more especially in situations where the length of the period between the baseline year and the considered year was very short, and when the effect is analyzed by district partitioning. These findings are comparable to findings in some related studies. However, the difference with the studies that found migration to be pro-poor rests with the approaches used. Whereas some used the regression approach, others used the life history approach. These approaches assume that the path from the baseline year to the last year of observations is the same. In contrast, the decomposition approach used in this paper compares the poverty behaviour between two data-points, taking the remaining data points as constants.

The implications from the study are two-fold. First, without taking the population shifts effects that had mixed results into consideration, the paper's other findings indicate that poverty increased over the period under study. In this regard, the appropriate policy response is to initiate and implement interventions for increasing productivity, particularly agricultural productivity, which would increase the incomes of mainly the rural poor. However, when the decomposition of poverty with respect to urban-rural or district partitioning is also considered, the results with regard to migration effects tend to show that urban areas have an influence on poverty trends, as they affect the direction of migration over time. Hence, the policy response in this regard should be geared at creating pro-poor employment in urban areas.
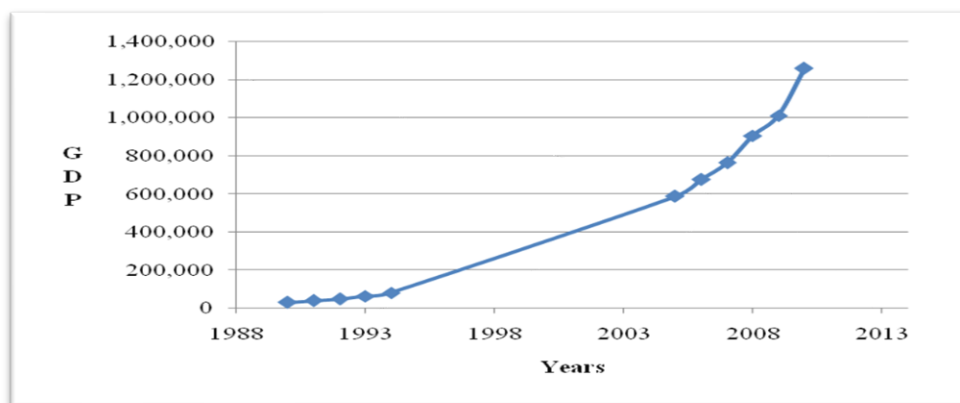
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APPENDIX

Appendix 1: GDP Trend for Kagera Region, Selected Years

Source: Authors' plot from the Regional Data