

The Impact of Urbanization on the Overall Well-Being of the Populace in Sub-Saharan Africa from 2010 to 2021

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Abstract

This research empirically investigates the impact of urbanization on the overall well-being of the populace in Sub-Saharan Africa from 2010 to 2021. Panel data from the World Development Indicators (WDI) 2022 were used in the study using the Generalized Method of Moment (2-System GMM) approach. The results show that urbanization (logpop) has a negative and significant

impact on total well-being (lex) in SSA nations. Again, the result revealed that carbon dioxide (CO₂) had a considerable detrimental influence on overall well-being in SSA nations. However, the results demonstrate that both household income (income) and log of education (education) are statistically insignificant even at the 10% level, despite having predicted indications. As a result of these findings, the study advises that the urban-rural gap be adjusted by sufficiently providing infrastructural and basic amenities such that the quality of well-being obtained in both urban and rural areas is seemingly indifferent. In addition, the study suggests that the amount of acid rain, especially CO₂, per person in SSA should be drastically reduced as everyone should be informed the environmental consequences of his activities via the appropriate stakeholders, and this could be accomplished by enacting a global policy on environmental quality in view of attaining sustainable development goals.

Keywords: *Overall well-being, Urbanization, Population Growth, Environmental Quality*

JEL: I31, Q56, Q58, Q53, Q50

Introduction

Urbanization is unparalleled in many cities in sub-Saharan Africa, just like Lagos State in Nigeria which is recording yearly urban growth rates of 5.8%. This is mostly driven by demographics, with no corresponding socioeconomic returns or benefits to the metropolitan environment, and has resulted in several urban health crises, such as insufficient safe water supply, squalor and shanty settlements, sanitation, solid waste management, a double burden of disease, and an inefficient, congested, and dangerous transportation system. But when an environment is correctly managed, urbanization has the potential to lessen hardship and human suffering while potentially increasing poverty and squalor. Some laws must be changed in order to change the status of poor urban communities (Alhaji, A., & Lawal, A. 2017).

Immediately a city is established, its bodily structure and land use patterns will start to change for several generations, which can result in uncontrolled sprawl. By 2030, the world is predicted to have 1.2 million km² more of urban built-up area because urban land consumption is expected to continue to expand at a rate that is up to 50% faster than population growth. Such sprawl strains the availability of land and natural resources, which has unfavorable effects (United Nations,

2014). Cities account for more than 70% of greenhouse gas emissions and two-thirds of the world's energy usage. To meet the accelerated demand for affordable housing, a functioning transportation infrastructure, basic services, and jobs, in particular for the nearly 1 billion urban poor who live in informal settlements to be close to opportunities, the speed and scale of urbanization present challenges. Since more than 50% of those who have been forcibly displaced live in cities, escalating war adds to the pressure on metropolitan regions (Ivan, T. & Gordon, M., 2013)

According to a United Nations Report (2014), around 66 percent of the world's population will be living in cities by 2050, and 41 urban agglomerations or megacities will emerge by 2030. Since the 1950s, the global urban population has grown dramatically, and this trend is expected to continue in the coming years. It was proposed that the rural population is currently predicted to be 3.4 billion people and is expected to fall to 3.2 billion by 2050. Several decades ago, the majority of the world's largest urban concentrations were found in more developed countries, but today, large cities are found mainly in the global South and Sub-Saharan Africa, and the fastest-growing agglomerations are medium-sized cities and cities with a population of 0.5 million.

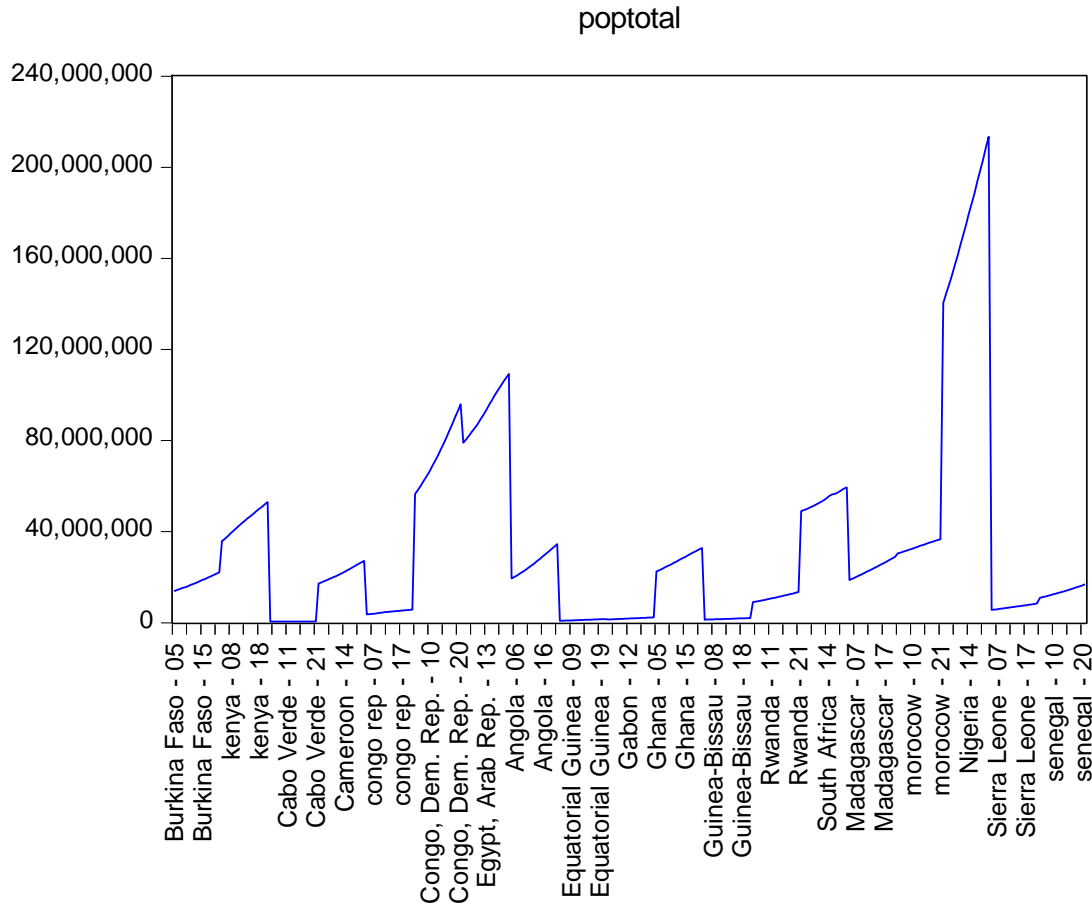
The 143 cities of SSA make a total of \$0.5 trillion, accounting for half of the average region's gross domestic product (GDP) (Lindfield, M., & Kweku B., 2022). Natural disasters are more likely to hit urban areas as population growth is putting pressure on the available infrastructure and basic services like safe drinking water, proper sanitation and drainage scheme, and health-care accessibility, thereby lowering the overall well-being in those regions (UN, 2018). This is becoming increasingly important to discuss in light of the challenges posed by or worsened by the effects of climate change. A drastic change in weather around the world has made cities to become vulnerable to water scarcity and severe flooding. Cities in coastal locations must also address the impact of rising sea levels.

According to the United Nations (2018), living in an urban area is generally linked to a high amount of one's literacy level and educational attainment, finer health status, accessible socio-economic resources, and increased chances of inclusiveness in cultural and political activities. Nonetheless, when the essential framework is not constructed or policies are not effectively carried out, rapid and accidental urban growth, as well as urban expansion, pose a threat to long-term development. Rapid sprawl, pollution, and environmental degradation resulting from unplanned

or poorly managed urban expansion, as well as unsustainable production and consumption habits, affect the overall well-being (Abdulkarim, 2023). Rapid urbanization, high population density, and high spending rates in megacities have resulted in a slew of local and global socio-economic and environmental consequences that demand immediate attention.

Figure 1 below shows that Nigeria, Congo DR, Ethiopia and South Africa, in particular, are most populated economies in Sub-Saharan Africa (SSA) with significant increase in urban population. In 2020, urbanization accounted for more than 80% of the world's GDP showing that it can support sustainable growth through improved productivity and innovation (United Nations, 2020). From the figure it shows that Nigeria has is indeed giant of Africa with respect to population followed by Congo republic and Democratic Republic of Congo but these countries are among the countries with the lowest current health expenditure per capita in countries in Sub-Saharan Africa as seen in figure 2 below.

Fig. 1: Urban Population in Sub-Saharan Africa

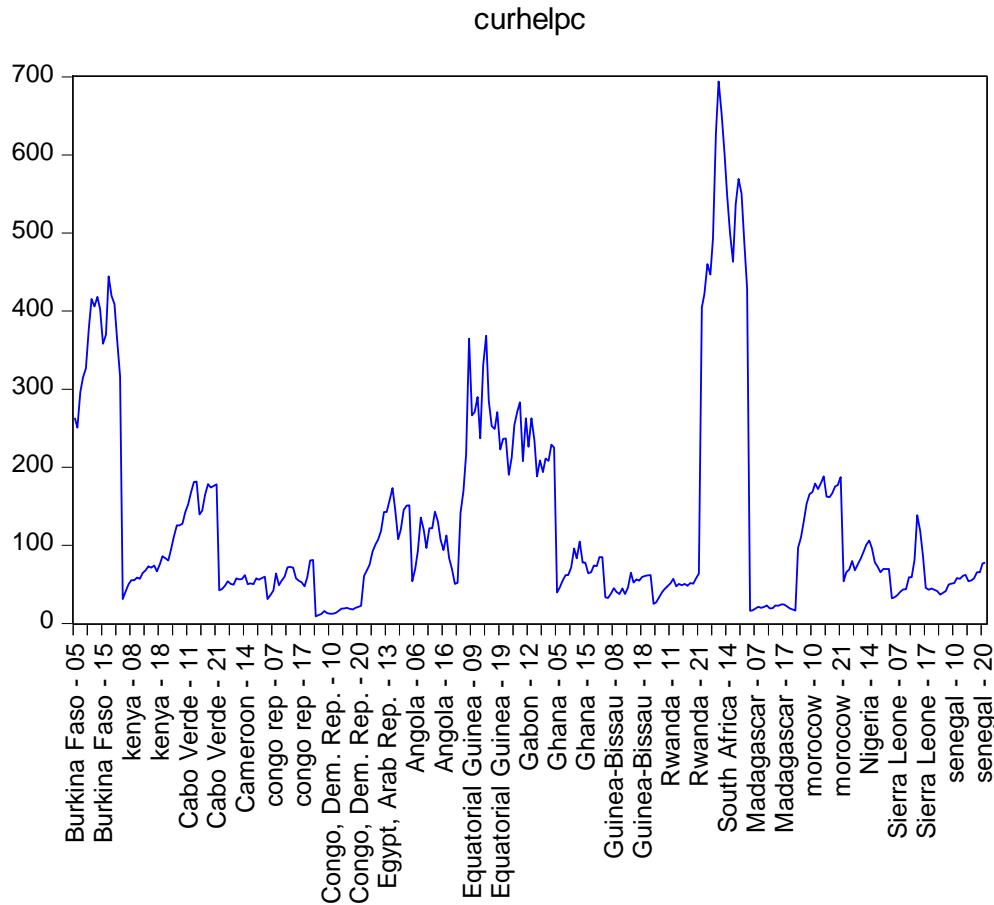


Urbanization is one of the major sources of concern in terms of overall well-being, particularly in Sub-Saharan African cities (Ghosh & Dinda, 2020; Saghir & Santoro, 2018). According to the United Nations (2017), more than half of the world's population now lives in cities. That by 2050, this percentage is expected to rise to 75%, with an annual increase of 65 million urban people. SSA is sometimes referred to as the world's fastest-growing metropolitan region. The current estimated population of 472 million people in urban areas is expected to double in the next 25 years. A 20.2% increase in number of Africans in cities will expected in 2050 (Ghosh & Dinda, 2020).

It can be seen in figure 2 below shows that expenditure on health has been low in most countries in Sub-Saharan Africa except countries like South Africa that has an increased current health

expenditure on health per capita. Commitment to health expenditure and improved income per capita are another key contributors to a country's overall well-being of any economy (Saghir & Santoro, 2018) and SSA has the lowest health spending per capita of any other economic region in the world, at 580 US dollars in 2014, compared to an OECD average of 2550 US dollars.

Fig.2 Current health Expenditure per capita in Sub-Saharan Africa



Environmental quality is an important aspect of people's well-being since the environment's health has a significant impact on people's overall well-being (Štreimikienė, 2015; Kahn, 2002). The health of the environment impacts significantly on people's lives. Health of individuals are significantly impacted by pollutants and unhealthy substances. Quality of an environment cannot be overemphasized as a surroundings beauty and health are enjoyed by people living therein who are also concerned about the draining of natural resources (Pradhan, Sharma & Pradhan, 2020).

One of the most significant components in guaranteeing the long-term preservation of well-being is environmental and natural resource protection (Liere & Dunlap 1980).

Fig 3 in the appendix shows that carbon emissions have not dropped in each country, 2017 and 2018 shared a similar trend. This indicates that the Sub-Saharan Africa environment has not been taken care-off in these periods. South Africa is the highest emitting country as seen in fig.3. It is understandable that environmental policies play a key role in addressing global health issues and promoting ecologically responsible behaviour and lifestyles (Felix & Garcia-Vega, 2012).

According to economic theory, an increase in the rate of unplanned urbanization hurts the environmental quality as well as overall well-being and this because more people will be forced to share the limited available facilities in urban regions, resulting in negative repercussions such as increased traffic bottlenecks and an increase in crime rates in metropolitan areas. Overall well-being or well-being of the economy is influenced by a variety of elements, ranging from individual status to social-level results and environmental factors such as urbanization. It is a psychological state of contentment that is influenced by a variety of factors. Each of the factors has an impact on the overall well-being, but they all operate together (Nathaniel and Khan, 2020)

. However, some African governments have made efforts to curbing population increase as well as improving living standards in rural areas. Some of these include Nigeria's rural electricity initiative, Kenya's better agricultural system, and a few other countries, but in all, the overall well-being has not improved significantly. All of these efforts, which include boosting environmental and health spending have yielded insignificant effects (World Bank, 2018) as the region's overall well-being is worsening.

Significance of the Study

The purpose of this study is to examine the impact of urbanization on the overall well-being in Sub-Saharan Africa. The discovery will help determine the influence of the region's current urban development expansion on some overall well-being indicators. The study will benefit the government, the general public, and researchers tremendously. As the ultimate purpose of government is to raise welfare, which leads to increased overall well-being, the findings of this

study will assist the government in identifying the important macro variables that are critical to boosting the overall well-being of its residents. Researchers in the domains of health economics, the environment, and logeducation will find this study useful in supplementing the scant literature on overall well-being in SSA. Finally, the findings will be valuable in promoting good environmental practices in the region to help lessen the negative effects of urbanization, which will benefit the general population. Furthermore, this approach will help the administration comprehend the importance of diversifying the economy to include other sectors.

Literature Review

Theoretical literature

Modernization Theory

Urban development in this theory, is seen as a stage most essential to natural shift from traditional (agrarian) to modern (industrial) culture, the foundation of national wealth is a robust economy (Jacob, 1971). The less reliant a country is on agriculture as opposed to its reliance on manufacturing and services, the more urban areas turn out to be very essential to economic development.

Dependency Theory

According to the dependence theory, urban regions can only form, extend, and develop if agriculture is properly developed. The emerging world provides input to the developed world (Mahoney & Rodríguez-Franco, 2016). As a result, developing countries attract more foreign investment in sectors of agriculture and non-agriculture. Rural farmers and casual workers were pushed out by developed agriculture while growing industries attracted labourers due to the vast work opportunities in metropolitan regions. As the economy changes, this leads to urban-rural migration.

Empirical literature

Panahi and Aleemran (2016) examined the effect of inflation, health expenditure, and urbanization on life expectancy in the Middle East and North Africa Countries (MENA)'. The study argued that a main summary measure of health is life expectancy. The study adopted a causal analysis by using panel data for 2000 - 2012 for Middle East countries and North African countries. The result

revealed that the Coefficients for variables used were in line with theoretical basis in such a way that, increase in the inflation by a unit as a result demand pressure and proposes the use of suitable policies by policymakers.

Patrick (2018) looked into health, wellness, and overall well-being of opiate addicts being medically treated for their addiction. Quantitative longitudinal study approach was adopted for adult patients undergoing two outpatient opioid treatment programs (OTP). The resulting fact was that small long-term changes in the patients' six dimension overall well-being, which has limited practical or clinical significance.

Qing (2018) examined the effect of urbanization on global health and the role of air pollution with an Unbalanced panel data made up of 3, 093 observations of 163 countries for a period of 1990–2012 (from World Bank database). contemporary and long-term effects of urbanization on health outcomes (measured by mortality, under-five mortality, infant mortality, life expectancy at birth) was estimated using infinite distributed lag model. Urbanization and global health had short and long term positive relations.

Nathaniel and Khan (2020) explored the relationship existing between health financing, environmental quality, and OWB in Nigeria. The test of adoption for this study was the Bayer and Hanck co-integration test, which affirms co-integration. The result records no meaningful impact of CO₂ emissions on short-run life expectancy, and on a long-run front, urbanization significantly deteriorates OWB.

Salahuddin, Ali, Vink, and Gow (2019) studied urbanization and globalization's effect on CO₂ emissions in SSA. The study employed second-generation panel data estimation techniques for 1984 to 2016. The result reported urbanization to increase carbon emissions in SSA significantly. The further result shows that globalization does not have any statistically significant impact on CO₂ emissions in the region.

Ali, Bakhsh, and Yasin (2019) explored how urbanization impacts on carbon dioxide emissions in Pakistan from 1972-2014 using ARDL bound testing for co-integration test and Vector Error Correction Model (VECM), for the analysis. The resulting fact was that co-integration among

variables exists and urbanization increases carbon emissions.

Siddique, Majeed, and Ahmad (2020) explored the relationship between urbanization, CO₂ emissions, and energy consumption in South Asia, from 1983 to 2013. Panel co-integration, Granger causality test was done. CO₂, energy consumption, and urbanization were found to have long run relation. Energy consumption and growth of an economy were also found to be affecting environmental quality.

Nathaniel and Khan (2020) examined the link between public health financing, environmental quality, and the overall well-being in Nigeria. Results showed that Co-integration exists among the variables. It was deduced that CO₂ emissions have an insignificant impact on environmental quality while urbanization significantly lessens overall well-being in the long run. It was also discovered that public health expenditure to not have meaningful contribution to overall well-being in Nigeria.

So this study is to answer these issues about how urbanization affects the overall well-being in Sub-Saharan Africa by including health, environmental, and economic indices as factors that affect the overall well-being and this will be conducted using two-system GMM estimation.

Materials and Methods

The Data

The data is an annual secondary data of 25 countries in SSA for the period of 22 years from 2000 to 2022 is used in this analysis and was sourced from the World Bank's World Development Indicators (WDI), CBN Bulletin, and United Nations Development Report (WDI, 2022). The period of study (2000 – 2022) is significant as it shows 22 years

Results and Discussions

Results

Table 1 Two-step System GMM Short Run Regression Results

Dep. Var: <i>lext</i>	Coef.	St.Err.	t-value	p-value
<i>lext</i> (-1)	.438	.241	2.62	.016
co ₂	-.151	.023	-6.64	.000
<i>Logpop</i>	-.140	.068	-2.20	.041
Foodp	.023	.001	-2.36	.029
Inc	.004	.002	1.71	.103
Cuhealth	.008	.001	5.45	.000
Logeduc	.019	.014	0.68	.502
Constant	5.424	.811	4.22	.000
F-test			16523.44	.000
AR(1)			-1.69	.091
AR(2)			-1.16	.246
No. of Instruments			19	
No. of Cross-sections			20	
No. of Observations			113	
Time Effect			NA	
Cross-section Effect			NA	

Notes: AR(1) and AR(2) denote Arellano-Bond test for first and second-order autocorrelations respectively; St. Err. = standard error; Coef. = coefficient; ln = natural log, NA = not available.

Source: Authors

The results shown in Table 1 as seen in the appendix are the two-step system generalized method of moments (GMM) regression results. The time and cross-section effect are not accounted for in this study, both were found not to be reasonably significant during simulations.

The first lag of life expectancy (*lext*) is statistically significant at 5% with a positive association to

the current value of the dependent variable (*l_{ext}*). This implies that previous period *of well-being will* positively improves present period *well-being*. Obviously, increasing the past period by 1% increases present *well-being* by about 44% on average in the short run. Carbon dioxide emissions per capita (*co₂*), and urbanization (*logpop*) are all statistically significant at 1% and 5% each respectively and still with positive associations.

The result shows that urbanization (*logpop*) and environmental quality (*co₂*) is statistically significant but negatively related to the overall well-being in SSA. This means that if the population of urban residents increases by 1%, the average expected life span for individuals in SSA countries will decrease by about 14% in the short run all things being equal. This result is not however surprising as one can argue that population congestion or density could lead to an outbreak of certain diseases which may lead to loss of life by residents. Another explanation could be that, as is the case in most SSA nations, urban population growth without corresponding infrastructure development will put additional strain on the system, possibly reducing accessibility for residents and possibly shortening life expectancy. As a result of poor rising energy consumption that is not environmentally friendly, such as fossil fuel and other non-renewable consumption, environmental quality (CO₂ emissions) in a populous area is concerning, especially in SSA (EEA, 2004). The total model is statistically significant at a 1% level, according to the F-test results, which means that all explanatory factors used in this study are jointly important determinants of the average longevity of people in SSA.

Table 2: Long Run Results of the Significant Short Run Variables

Dep. Var: <i>l_{ext}</i>	Coefficient	Standard Error	Z-statistic	P-value
<i>co₂</i>	-0.407	0.226	-1.800	0.072
<i>Logpop</i>	-0.404	0.414	-0.980	0.329
<i>Foodp</i>	0.049	0.008	-1.050	0.292
<i>Cuhealth</i>	0.020	0.011	1.830	0.068

Source: Authors

Table 2 shows the long-run test results conducted on only the significant short-run variables as seen in Table 1 above. The results show that under the 5% significance threshold, none of the short-run variables are statistically significant, and these imply that, in so far as *co₂*, *logpop*, *foodp*, and *cuhealth* are all significant determinants of life expectancy (*lxt*) in SSA in the short run, they could not explain the average life expectancy (*lxt*) in the long-run.

Table 3 GMM Diagnostics Tests

Tests	Chi-Square Statistic	P-value
Sargan	8.95	0.718
Hansen	9.49	0.711
AR(1)	-1.64	0.097
AR(2)	-1.11	0.248

Source: Authors

Table 3 shows the regression diagnostic test results suitable for generalized method of moments (GMM) valuation, where both the Sargan and Hansen tests were used to test for over-identifying restrictions of instruments, while the Hansen test is a known test often reported in the literature, so emphasis will focus more on it. Both tests, however, reveal that the employed instruments are not weak; hence, they are exogenous. Specifically, the Hansen test of the exogenous instrument shows that the null hypothesis of exogeneity of the instruments cannot be rejected at the 5% level, so we settle that the model instruments are exogenous. This can effortlessly be observed from the large *p-value* of 0.711 corresponding to the Hansen test, which is larger than the 5% conventional level.

Similarly, first and second-order serial correlation tests for GMM put forward by Arellano and Bond (1998) are shown by the AR(1) and AR(2) tests. Although it has been shown in theory that first-order serial correlation is always anticipated following GMM estimate, this is not the main point of discussion. The second-order serial correlation represented by the AR(2) is the area of

most interest. The AR(1) and AR(2) tests in this instance indicate that the null hypothesis of no serial correlation of the error term between the two time periods cannot be rejected at 5%, indicating that the regression residual is not serially correlated at both the first and second lags. This outcome renders the predicted model reliable

Discussions

This study investigates the relationship between urbanization and overall well-being in SSA using data from 2010-2021. To achieve the objective of the study, two-step GMM was used. The result shows that urbanization has a negative significant impact on the overall well-being in SSA. Meaning that in the short run, increased urban population will be associated with the decline in the overall well-being in SSA. Also, environmental quality (*CO2*) is found to significantly reduce the overall well-being of SSA in the short run.

Finally, the diagnostic tests applicable to GMM estimation, such as the Hansen, AR(1), and AR(2) tests, show that the model is good and reliable. Specifically, the Hansen test shows that the employed instruments are not weak; hence, they are exogenous. Also, both first- and second-order serial correlations presence could not be substantiated given the large p-values of AR(1) and AR(2), which are larger than the 5% conventional level.

Policy Implication/ Recommendation

Following the findings of this study, the following recommendations were made;

- a. Because urbanization has been shown to considerably reduce the overall well-being in SSA, different measures to urban decongestion in SSA are advocated. One of these techniques could be to bridge the urban-rural divide by providing equal access to infrastructural and social amenities, so that the quality gained in both urban and rural areas appears to be indifferent. This will relieve the strain on urban facilities caused by fast urban population increase.
- b. Poor environmental quality continues to be one of the key causes of diminishing overall well-being in SSA, and as such, we urge that the quantity of CO₂ released per person in SSA be dramatically decreased by enacting global clean technology policies and deploying green innovations.

- c. The appropriate government agencies responsible with raising the per capita income of SSA inhabitants are advised to double their efforts. People spend their actual riches on health, thus each SSA country's government must work to improve the business and economic climates there.
- d. Increased public health investment by SSA governments is advised, towards the creation of CO₂ emission-reduction strategies. Enhancement achieved by the use of renewable energy, improved agricultural techniques, and food production.

Conclusion

In conclusion, this study examines the relationship between urbanization and overall well-being in sub-Saharan Africa (SSA). Consistent with Nathaniel and Khan's (2020) findings, this study reveals that urbanization (*logpop*) negatively and significantly affects the overall well-being (*lxt*) in SSA countries. This finding, however, contradicts the earlier findings of Zhenhua Z., Ningcheng Z., Yunpeng Z., and Yanchao (2023), as well as Qing (2018), who showed that urbanization and health spending are associated with an increase in life expectancy in the MENA countries. This difference could be due to regional developmental disparities and the use of the GMM method. In addition, our findings showing the significant direct impact of private health spending (*cuhealth*) on the overall well-being of SSA countries are consistent with the findings of Panahi and Aleemran (2016). Similarly, our findings of environmental quality negatively impacting overall well-being in SSA countries also support the existing findings of Cavusoglu and Gimba (2021), but our findings of the significant negative impact of food production on overall well-being contradict their findings on food production impact.

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