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HUMAN SECURITY AND INTERNATIONAL MIGRATION DYNAMICS IN SUB-SAHARAN AFRICA: A DYNAMIC PANEL ANALYSIS

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Abstract

This paper investigates how human security influences international migration in sub-Saharan Africa (SSA). Despite an expanding body of literature on African migration, empirical studies often remain narrowly focused on economic factors, neglecting the broader structural insecurities that shape mobility. To bridge this gap, the paper incorporates a human security framework encompassing political, environmental, economic, and food security dimensions into a dynamic panel analysis of 34 SSA countries from 2006 to 2021. The research utilises secondary data from various international sources and databases. Using the System Generalised Method of Moments (System GMM) framework, which accounts for endogeneity, reverse causality, cross-country heterogeneity, and the persistence of migration, our results indicate that international migration in SSA is highly persistent, with strong network effects shaping migration patterns. Several human security indicators markedly influence migration flows. Political security indicators – such as political stability and conflict-related fatalities – significantly increase migration. Environmental factors, such as climate vulnerability, have a significant positive effect on migration, while the Standardised Precipitation Evaporation Index (SPEI) decreases migration, suggesting that drier climatic conditions correlate with increased migration flows. Economic security, represented by GDP per capita, also boosts migration, as do higher urbanisation levels. Food security indicators – food production and undernourishment – are linked to increased migration. This paper contributes to the literature by providing a comprehensive

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and robust empirical analysis of the relationship between human security and migration, highlighting that policy actions should integrate political stability, climate resilience, and improvements in food and economic security to address the root causes of migration.

***Keywords**: Human Security; International Migration; System GMM; Sub-Saharan Africa; Migration Persistence*

Introduction

The concept of human security marks a fundamental paradigm shift in how security is understood in policy discourse. Conventionally, security had been conceived almost exclusively in state-centric terms – focused on territorial integrity, military power, and the protection of nation-state borders from external threats (Wolfers, 1952; Nye & Lynn-Jones, 1988). This orthodox conception treated individuals and communities as subordinate to the state's overarching security interests. In the past couple of decades, new forms of threats have emerged – hunger, environmental degradation, ethnic conflict, economic deprivation, and political repression –which render millions of people deeply insecure not through inter-state wars but through failures of governance, development, and global economic inequality (Vietti & Scribner, 2013; Sirkeci, 2008).

In this context, the United Nations Development Programme (UNDP) introduced human security as a new organising framework for thinking about security at the individual rather than the state level in 1994 (UNDP, 1994). The UNDP (1994) defined human security as the condition of being free from two foundational threats: freedom from fear – protection from violent, physical, and political threats – and freedom from want – freedom from deprivation, disease, poverty, and hunger. This definition was deliberately people-centred, arguing that states exist to serve people's security, not the other way around (Estrada-Tanck, 2012; Gasper & Sinatti, 2016).

The UNDP (1994) introduced a multidimensional conceptualisation of human security comprising seven distinct domains including economic security, ensuring basic income and livelihoods; food security, involving access to adequate nutrition; health security, including freedom from disease; environmental security, encompassing access to clean water, air, and a non-degraded natural environment; personal security, covering protection from physical violence; community security, protecting cultural identity and social belonging; and political security, guaranteeing fundamental human rights and freedoms. These dimensions are deeply interconnected because degradation in one domain tends to compound insecurities in others, creating cascading vulnerabilities that frequently culminate in involuntary displacement and migration (Terminski, 2012; Arafa, 2023). Individuals migrate not only to escape physical danger but also because insecurity across economic, environmental, food, and political domains renders their home environments untenable (Vietti & Scribner, 2013; Gasper & Sinatti, 2016).

International migration remains a major socio-economic shift in sub-Saharan Africa (SSA), where movement increasingly reflects responses to intricate and interconnected insecurities. While economic inequalities and labour market dynamics have traditionally been viewed as significant influences on migration, recent findings indicate that migration choices in SSA are heavily shaped by various aspects of human insecurity, such as environmental disturbances, poor governance, persistent poverty, and food system instability (Wolde et al., 2023; Williams, 2024). Increasing climate variability, internal strife, and unstable livelihoods persistently undermine well-being across the region, fostering conditions in which mobility becomes a survival tactic rather than merely an economic option (International Organisation for Migration, 2024). These realities highlight the need to reassess migration from a human security perspective that accounts for the complex, interconnected vulnerabilities that shape mobility.

The migration–human security nexus has attracted substantial scholarly attention since the early 2000s. Vietti and Scribner (2013) argued that a human security framework offers a more effective analytical approach to understanding the root causes of mass migration than state-centric security models, which tend to frame migrants as threats rather than as people responding to threats. Gasper and Sinatti (2016) similarly argued that a human security approach is migrant- and person-centred, systematically investigating the vulnerabilities and opportunities of individuals as complex social actors rather than reducing them to statistical flows. Purkayastha (2018) extended this framework to encompass glocal terrains of migration – the intersection of global structural forces, national policies, and local conditions – arguing that questions of migrants' human security cannot be understood without integrating insights across international migration, internal migration, and forced displacement.

Although migration research has grown in recent years, significant theoretical and practical gaps persist. A substantial portion of the literature continues to emphasise narrow economic interpretations, often overlooking the structural vulnerabilities that shape cross-border movement. Current studies frequently rely on isolated, single-factor analyses, focusing, for instance, solely on climate fluctuations or conflict, without considering how various insecurities interact to influence migration (Wolde et al., 2023; Aurélien & Marthe, 2026). Moreover, SSA is underrepresented in empirical studies that consistently incorporate human security into migration analysis, despite the region's significant exposure to political instability, food insecurity, and climate-related disruptions (Williams, 2024). This creates a significant gap in understanding how multidimensional insecurity shapes mobility trends in a region that will remain vital to global migration patterns in the decades ahead.

This research seeks to address these gaps by empirically integrating the human security framework into the study of international migration in SSA. It examines five key research questions on how economic insecurity, food insecurity, political instability, en-

vironmental vulnerability, and ongoing migration shape international migration patterns in SSA. To do so, the study incorporates the human security framework into empirical migration analysis and utilises a dynamic panel approach to assess how different forms of insecurity influence these patterns. By analysing the interactions among these factors, the research aims to provide deeper, evidence-based insight into the causes of migration.

Specifically, the research aims to respond to these questions:

(1) To what extent does economic insecurity influence international migration flows in sub-Saharan Africa?

(2) How does food insecurity affect migration dynamics across the region?

(3) What role does political instability, including conflict and weak governance, play in shaping migration decisions?

(4) Do environmental vulnerabilities, particularly climate risks and natural disasters, significantly influence migration behaviour?

(5) To what extent do past migration patterns and network effects contribute to the persistence of migration flows in SSA?

The research offers numerous important contributions to the existing literature. First and foremost, it enhances conceptual understanding by integrating a comprehensive human security framework, shifting away from economic-focused methods towards empirical migration analysis in SSA (Mnisi et al., 2024). Secondly, the research utilises a dynamic panel econometric approach using the System Generalised Method of Moments (System GMM), a technique adept at addressing endogeneity, reverse causality, and continuity in migration trends (Maket et al., 2023; Vossen, 2026). Third, the study provides region-specific empirical data for SSA, a region where migration is closely linked to structural insecurities yet remains under-researched (International Organisation for Migration, 2024). Fourth, the results will guide policy by pinpointing which aspects of insecurity most significantly affect migration choices, aiding the creation of cohesive migration, development, and human security approaches. Ultimately, this study lays the groundwork for future comparative research in other areas experiencing similar insecurities by creating an analytical framework that addresses the human security–migration connection (Kanga et al., 2024). The research enhances comprehension of migration patterns in sub-Saharan Africa by centring human security within migration studies and utilising robust empirical techniques to shed light on the foundational factors driving mobility.

Methodology

Data and Description of Variables

The study focused on Sub-Saharan Africa. The paper used data from thirty-four (34) countries in Sub-Saharan Africa (see Figure 1) covering a period of sixteen years

(2006 – 2021). Data on the variables used in this research were sourced from the Notre Dame Global Adaptation Initiative, the World Bank Group's World Development Indicators, the Kaggle database, the World Bank Group's Environmental, Social and Governance Database, and Our World in Data (see Table 1), all of which are publicly available on the respective organisations' websites.

The selection of 34 countries is primarily based on the availability and adequacy of data for all variables included in the study. Countries with substantial missing data were excluded to ensure the robustness of the panel dataset. The period 2006 to 2021 was chosen because it offers relatively complete and available data across the study variables and captures important phases in Africa's conflict and security landscape, including the rise of non-state armed groups.

Figure 1. *Map of Africa showing countries studied*

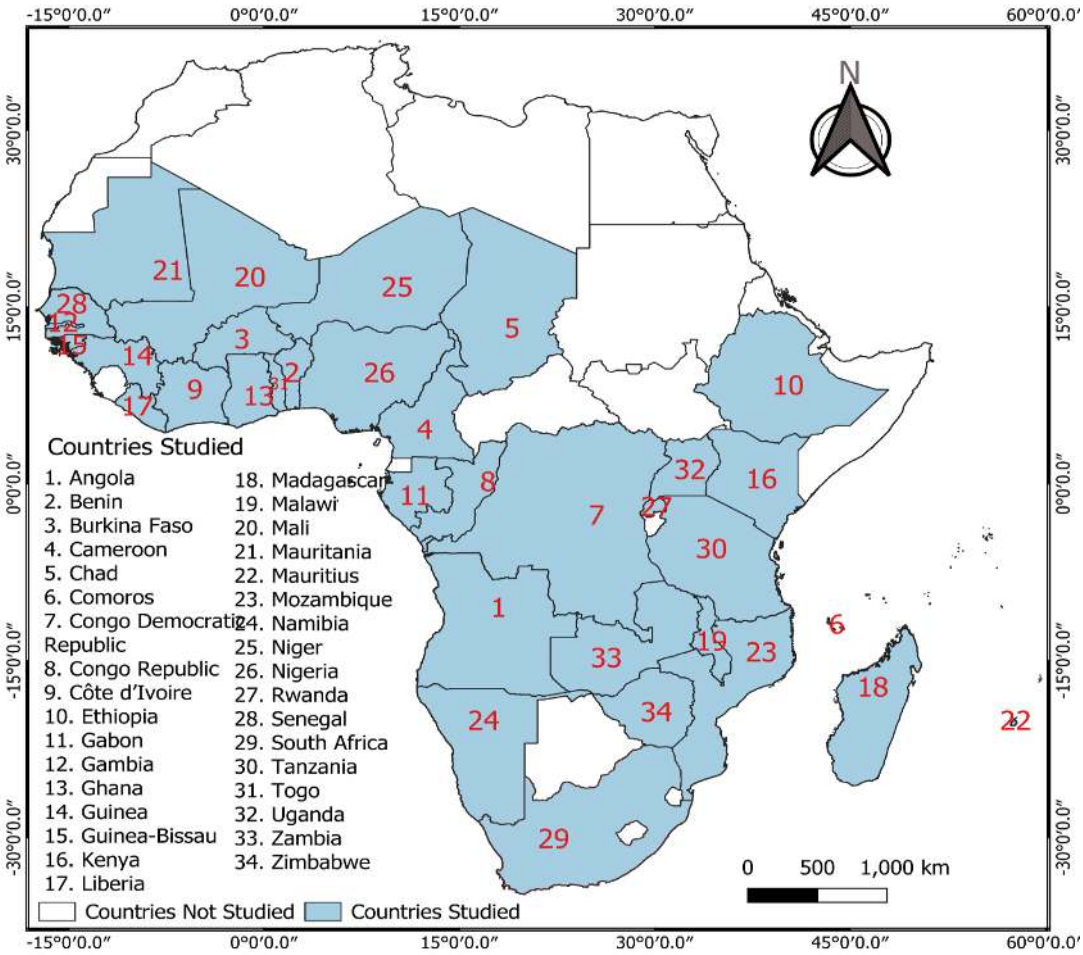

Table 1. *Description of the variables*

Variables	Data Source	Link
Net Migration (number)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#
Rule of Law (number of sources)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#
Government Effectiveness (number of sources)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#
Political Stability and Absence of Violence/Terrorism (number of sources)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#
Deaths in ongoing conflicts in a country (best estimate) - Conflict type: all (number)	Kaggle database	https://www.kaggle.com/datasets/saurabhbadole/countries-in-conflict-dataset
Standardised Precipitation-Evapotranspiration Index (Proxy for Drought)	Environment, Social and Governance Database of the World Bank Group	https://databank.worldbank.org/source/environment-social-and-governance-(esg)-data/Series/EN.CLC.SPEI.XD
Vulnerability score	Notre Dame Global Adaptation Initiative	https://gain.nd.edu/our-work/country-index/download-data/
Annual temperature anomalies	Our World in Data	https://archive.ourworldindata.org/20260309-085120/grapher/annual-temperature-anomalies.html
GDP per capita (current US$)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#
Unemployment, total (% of total labour force) (modelled ILO estimate)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#
Prevalence of undernourishment (% of population)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#
Food production index (2014-2016 = 100)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#
Urban population (% of total population)	World Development Indicators of the World Bank Group	https://databank.worldbank.org/source/world-development-indicators#

Analytical Approach

The static model is as follows in equation 1:
MIG
=f(RULE,GOVT,POLS,CONF,TEMP,SPEI,VUL,GDP,UNEMP,URBAN,
FOOD,UNDER) (1)
Where:
MIG = Net Migration (Number of persons)
RULE = Rule of law (Number of sources)
GOVT = Government Effectiveness (Number of sources)
POLS = Political Stability (Number of sources)
CONF = Deaths arising from Conflicts (Number)
SPEI = Standardised Precipitation-Evapotranspiration Index
VUL = Vulnerability score
TEMP = Annual temperature anomalies
GDP = GDP per capita (current US$)
UNEMP = Unemployment, total (% of total labour force) (modelled ILO estimate)
UNDER = Prevalence of undernourishment (% of population)
FOOD = Food production index (2014-2016 = 100)
URBAN = Urban population (% of total population)

The study converted the observations for each variable to natural logarithms to address potential heteroscedasticity in the dataset. The study categorised the independent variables into four components of human security: political, environmental, economic, and food security. The dependent variable is net migration. The political security indicators include rule of law, government effectiveness, political stability and absence of terrorism and violence, and deaths arising from ongoing conflicts. The environmental security indicators include the standardised precipitation-evapotranspiration index, climate vulnerability score, and annual temperature anomalies. The economic security indicators include economic growth, measured as GDP per capita, and unemployment, while the food security indicators include the prevalence of undernourishment and the food production index. Urban population served as the control variable.

The generalised method of moments regression models is presented in equation 2:

$$\begin{aligned}\ln MIG_{it} = {} & \beta_0 + \beta_1 ln RULE_{it} + \beta_2 \ln GOVT_{it} + \beta_3 \ln POLS_{it} + \beta_4 \ln CONF_{it} + \beta_5 \ln TEMP_{it} \\ & + \beta_6 SPEI_{it} \\ & + \beta_7 VUL_{it} + \beta_8 \ln GDP_{it} + \beta_9 UNEMP_{it} \\ & + \beta_{10} URBAN_{it} + \beta_{11} \ln FOOD_{it} + \beta_{12} \ln UNDER_{it} + \varepsilon_{it} + u_i \quad (2)\end{aligned}$$

Where; *i*:1, 2, 3, …, 34 countries; *t*: 2006, 2013, 2014, …, 2021 year; ln denotes natural logarithm; ε is the error term. Furthermore, *β_1, β_2, β_3, β_4, β_5, β_6,β_7,β_8,*

β_9, β_10, β_11, and *β_12* define the estimated percentage change in net migration caused by a one per cent change in rule of law, government effectiveness, political stability, deaths arising from ongoing conflicts, temperature anomalies, standardised precipitation-evapotranspiration index – a measure of drought, climate vulnerability score, GDP per capita, unemployment, urban population, food production index, and undernourishment, respectively, while all other factors are constant. ε_it is the unobserved country-specific fixed effects.

The dynamic model is specified in equation 3 as follows:

$$\begin{aligned}\ln MIG_{it} = {} & \beta_1 \ln MIG_{it-1} + \beta_2 \ln RULE_{it-1} + \beta_3 \ln GOVT + \beta_4 \ln POLS + \beta_5 \ln TEMP_{it-1} \\ & + \beta_6 \ln SPEI_{it-1} + \beta_7 VUL_{it-1} + \beta_8 GDP_{it-1} \\ & + \beta_9 \ln UNEMP_{it-1} + \beta_{10} \ln URBAN_{it-1} + \beta_{11} \ln FOOD + \beta_{12} \ln UNDER_{it-1} \\ & + \varepsilon_{it} + u_i + \delta_t \qquad (3)\end{aligned}$$

Equation (3) includes two additional error terms, μi and δt, representing the idiosyncratic error term and the unobserved time effects, respectively. Including the lagged migration as an independent variable serves to assess whether migration is persistent over time and to address potential endogeneity. This is also why the system of generalised method of moments (GMM) econometric procedure proposed by Arellano and Bover (1995) was applied in this study.

Results

Descriptive Statistics

Table 2 presents the summary statistics of the variables used in the study for all 34 SSA countries. Three institutional variables, namely, rule of law, government effectiveness and political stability, were used in the study. The rule of law, government effectiveness, and political stability indicators had an average of 13.65, 9.77, and 6.33 underlying sources, with coverage ranging from 6 to 18, 4 to 12, and 2 to 9 sources, respectively, across all observations. The standard deviations of 2.5, 1.90, and 1.29 show moderate variation in the number of sources across observations. The study observed that net migration exhibits substantial variability, ranging from large net outflows (-879,235) to significant inflows (641,150), with a negative average of -5,669.7, indicating that countries in our sample experience net emigration on average. This is consistent with recent estimates suggesting that sub-Saharan Africa is predominantly a net emigration region (Li & Samimi, 2022). The variable of conflict-related deaths reveals considerable dispersion, ranging from zero to 13,532 deaths. The variable shows a relatively low mean of about 268 deaths but a large standard deviation (1035.61), indicating that the large number of conflict-related deaths may be associated with a small number of countries and a few con-

flict episodes. Data from the Armed Conflict Location and Event Data Project (ACLED) confirms that a few countries in SSA account for a disproportionate share of total fatalities. The variable for undernourishment shows an average prevalence rate of 19.18 percent, with values ranging from 3.4 to 48.1 percent. This shows wide heterogeneity in the prevalence of undernourishment across our sample despite a wide spread of food insecurity. Climatic variables used in this study, that is, standardized precipitation-evapotranspiration index and temperature anomalies, show visible variability within the dataset. The standardized precipitation-evapotranspiration index averages -0.22, which indicates slightly drier-than-normal conditions. Temperature anomalies variable also shows a slightly positive average of 0.22, which reflects warmer-than-normal conditions. These two indicators may have implications for the vulnerability of residents in the selected countries in the sub-region. The average vulnerability index was 0.53, with scores ranging from 0.40 to 0.66, indicating moderate vulnerability. This standard deviation of 0.05 shows a relatively low variation in vulnerability across our observations.

Table 2. *Descriptive statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
Rule of Law	544	6.00	18.00	13.65	2.50
Government Effectiveness	544	4.00	12.00	9.77	1.90
Political Stability	544	2.00	9.00	6.38	1.29
Net Migration	544	-879235.00	641150.00	-5669.70	86525.68
Deaths arising from Conflicts	544	0.00	13532.00	268.18	1035.61
Undernourishment	544	3.40	48.10	19.18	10.17
Standardised Precipitation-Evapotranspiration Index	544	-2.22	2.42	-0.22	0.85
Vulnerability	544	0.40	0.66	0.53	0.05
GDP	544	189.35	11818.75	1877.91	2204.49
Unemployment	544	.32	34.01	6.74	6.42
Urbanization	544	14.59	90.79	40.19	16.10
Food Production	544	48.54	183.45	96.63	18.53
Temperature Anomalies	544	-1.14	1.70	0.22	0.33

Multicollinearity Test

Table 3 presents the results of the multicollinearity test based on variance inflation factor (VIF) computations. The test results show that although some political security indicators (lnRULE and lnGOVT) exhibit moderate correlations with other predictors, their VIFs remain below the 10 threshold, which may indicate severe multicollinearity. This is consistent with standard practice, in which variables with VIFs below 10 are considered acceptable, especially if they are theoretically justified (Kutner et al., 2005; O'Brien, 2007). The two other political security indicators (lnPOLS and

lnCONF), together with all environmental, economic, and food security indicators, show no multicollinearity, as their VIFs are below 5 (Onyeneke et al., 2026, 2025).

Table 3. *Multicollinearity test*

Human Security Categorization	Variable	Tolerance	VIF
Political Security Indicators	lnRULE	0.161	6.201
	lnGOVT	0.152	6.593
	lnPOLS	0.234	4.268
	lnCONF	0.830	1.205
Environmental Security Indicators	lnTEMP	0.973	1.028
	lnSPEI	0.954	1.048
	lnVUL	0.314	3.188
Economic Security Indicators	lnGDP	0.296	3.377
	lnUNEMP	0.429	2.329
Control Variable	lnURBAN	0.506	1.976
Food Security Indicators	lnFOOD	0.706	1.416
	lnUNDER	0.719	1.390

a Dependent Variable: lnMIG

Cross-sectional Dependence

Table 4 presents the results of the cross-sectional dependence test based on Pesaran (2015). The results reject the null hypothesis of no cross-sectional dependence and confirm its presence in our dataset, indicating that the countries in our study share similar characteristics and shocks.

Table 4. *Cross-sectional dependence*

Human Security Categorization	Variable	CD-test	p-value
Political Security Indicators	lnRULE	54.08	0.000
	lnGOVT	59.58	0.000
	lnPOLS	56.83	0.000
	lnCONF	22.83	0.000
Environmental Security Indicators	lnTEMP	10.31	0.000
	lnSPEI	29.54	0.000
	lnVUL	36.39	0.000

Economic Security Indicators	lnGDP	47.79	0.000
	lnUNEMP	11.30	0.000
Control Variable	lnURBAN	76.43	0.000
Food Security Indicators	lnFOOD	58.93	0.000
	lnUNDER	2.43	0.015
Dependent Variable	lnMIG	19.73	0.000

Main Findings

Estimates of the effect of human security on migration are presented in Table 5. Post-estimation diagnostics indicate that the model is well identified and passes all key IV diagnostics. The lagged migration used as an instrument in the GMM estimation was found to be valid based on model diagnostics. The study failed to reject the null hypothesis of no overidentification, as indicated by the p-value of the Hansen J statistic, confirming that the instrument is valid. The Sanderson-Windmeijer multivariate F-test of excluded instruments (14.18, $p < 0.01$) shows that the instrument is valid and identified. The p-value of the Kleibergen-Paap rk LM test statistic shows the presence of a strong instrument by rejecting the null hypothesis of under-identification. The Anderson-Rubin test shows that our GMM estimates are not compromised by weak instruments. The Stock-Yogo weak ID test indicates that our instrument is sufficiently strong to keep bias below 10 per cent. Overall, the model explains 52% of the variation in international migration ($R2 = 0.52$), and the F-test confirms that the explanatory variables jointly explain this variation ($F = 248.85$, $p < 0.01$).

The results reveal a statistically significant positive persistence effect: past migration is a strong predictor of current migration. The study estimated that a percentage increase in the previous year's migration volume leads to an approximately 0.93% increase in the current migration volume. Beyond past migration, urbanisation was estimated to be a significant positive predictor of migration. The study estimated that a 1 percentage-point increase in the urban population as a proportion of the overall population will lead to about a 2.37 percentage-point increase in international migration.

Within the political security component of the human security framework, two of the four variables were significant predictors of migration. While the rule of law and government effectiveness were not significant predictors of migration, political stability and conflict-related fatalities were positively associated with international migration. The paper estimated that a percentage increase in political stability and in the number of conflict-related fatalities will lead to increases of 4.65% and 0.17% in international migration, respectively.

The environmental security component of human security, measured by three variables, yielded mixed results. While temperature anomalies had no significant effect on in-

ternational migration, the SPEI, which measures drought, did. The estimates show that the coefficient on lnSPEI is negative and weakly significant (-0.42), suggesting that wetter conditions are associated with a decline in international migration, implying that drier conditions increase migration. Additionally, the study estimated that higher vulnerability levels are associated with increased international migration. The results reveal that a percentage increase in vulnerability will lead to about a 9.32% increase in international migration.

Table 5. *Generalised method of moments, estimation results of the impact of human security on international migration*

Variables	Estimates
lnMIG(-1)	0.93*** (0.06)
lnRULE	2.60 (2.23)
lnGOVT	−2.98 (2.01)
lnPOLS	4.65*** (1.61)
lnCONF	0.17** (0.08)
lnTEMP	−0.005 (0.17)
lnSPEI	−0.42* (0.25)
lnVUL	9.32*** (2.96)
lnGDP	2.20*** (0.39)
lnUNEMP	−0.27 (0.30)
lnURBAN	2.37*** (0.61)
lnFOOD	1.80* (0.99)
lnUNDER	1.19*** (0.38)
Constant	−35.086***(6.66)
Observations	544
Groups	34
R2 (Centred)	0.52
F-test	248.85***
Post-estimation diagnostics	
Sanderson-Windmeijer multivariate F test of excluded instruments	14.18***
Hansen J Statistic (p-value)	0.498
Kleibergen-Paap rk LM statistic (p-value)	0.000
Anderson-Rubin Tests (p-value)	0.000
Stock-Yogo weak ID test critical values: 10% maximal IV relative bias	11.52

Note: The parentheses contain the robust standard errors.
***p < 0.01, **p < 0.05, *p < 0.1.

Both measures of the food security component of human security were found to be significant in explaining international migration. The study estimated that a percentage increase in food production and prevalence of undernourishment will lead to about 1.8% and 2.37% increases in international migration, respectively. Only one of the two economic security indicators was found to be a significant predictor of international migration. The study estimated that a percentage increase in GDP is associated with about a 2.2% increase in international migration.

Discussion

The study's results provide strong evidence of migration persistence, suggesting that international migration is a self-reinforcing process. Meso theories of migration, such as the network theory of migration, suggest that past migration reduces the costs and risks associated with migration by providing the necessary support system (Adhikari et al., 2023; Bernard et al., 2022; Bernard & Perales, 2021). As previous migrants settle and establish themselves in destination countries, they create migration pathways for people within their networks from their native countries, making it easier for new waves of migrants by providing information, financial support, and contacts (Sha, 2021).

The results were nuanced regarding political security indicators. While rule of law and government effectiveness did not appear to be significant predictors of international migration, political stability and conflict-related deaths were positively associated with it. The direction of the impact of political stability is somewhat counterintuitive. Studies such as Arif (2020) highlight that better political institutions serve as a pull factor of migration but have no push effect on migration. That is, improved political stability in destination countries may attract migrants, but improved political stability in originating countries has no significant role in migration decisions. On the contrary, Dutta and Roy (2011) and Barra and Ruggiero (2023) show that political stability significantly affects emigration rates, particularly among skilled workers. The authors contend that this is true for both developing and developed countries. This may be because a politically stable environment tends to enable individuals to accumulate the resources necessary to migrate. Further, Giménez-Gómez et al. (2019) contend that political persecution, civil conflicts and political instability drive African emigration, particularly into European destinations. Additionally, conflicts, and for that matter, conflict-related deaths, have been widely established as a driving force of migration in all parts of the world (Conte & Migali, 2019; Akindoyin & Akuche, 2024; Crippa et al., 2025). This is because people in danger of an imminent threat to their lives find migration a way of escaping their eventual demise.

The environmental security component reveals the complex relationship between climate variability and migration. The negative association between SPEI and migration suggests that higher drought intensity is linked to greater migration. This find-

ing aligns with a growing body of literature linking climate stress – particularly water scarcity and agricultural shocks – to increased emigration (Adaawen et al., 2019; Ceola et al., 2023; Defrance et al., 2023; Fishman & Li, 2022; Smirnov et al., 2022). While some studies indicate a direct association between drought and migration, others, such as Cattaneo and Foreman (2023) and Freeman et al. (2017), show that unfavourable climatic conditions induce resource conflicts, which ultimately lead to migration. By contrast, the insignificance of temperature anomalies in this study suggests that not all climate indicators have uniform effects. Moreover, the paper observed a significant positive relationship between vulnerability and migration. This is because, in conditions of high vulnerability, people are likely to resort to migration as a coping strategy (McLeman & Hunter, 2010; Singh & Basu, 2020).

The two food security indicators, as components of human security, showed positive associations with international migration. That is, higher food production and higher levels of undernourishment were associated with higher migration levels. The positive effect of undernourishment on international migration is consistent with the fact that food insecurity acts as a push factor for migration (Sadiddin et al., 2019; Smith & Wesselbaum, 2021). Smith and Floro (2020) further indicate that the severity of food insecurity increases intentions to migrate monotonically but reduces migration preparations. While the direction of the effect of undernourishment on migration is consistent with existing literature, the positive effect of food production requires a deeper understanding. The study contends that the positive effect of food production reflects an income effect arising from improved agricultural productivity. That is, increased food production offers households more income, which can be used to finance international migration, i.e., enhanced capacity to move.

This ties into the role of the economic security component of human security as a driver of international migration. Viewing GDP growth as a measure of improved economic conditions in origin countries, we contend that such improvement facilitates migration by easing the financial constraints associated with migration intentions. Financial constraints serve as a barrier to poor households who would like to migrate but cannot afford to (Angelucci, 2015). In effect, improved economic growth can make them better off, thereby increasing their ability to afford the expenses associated with international migration. Indeed, Kleemans (2015) contends that a positive income shock, likely from GDP growth, may increase international migration, as households can now afford to pay the costs of migration up front. Households bear such costs because they view migration as a form of insurance and believe that the investment will pay off eventually as the migrant begins to remit earnings from abroad (Simpson, 2022).

Conclusion and Policy Implications

The research indicates that international migration in SSA is shaped by an intricate combination of human security issues rather than by individual, separate factors. Political unrest, conflict-related violence, vulnerability to environmental risks, food insecurity, and economic strain all combine to influence individuals' decisions to migrate. Migration in the region tends to perpetuate itself over time, as established migrant networks reduce the costs and risks of movement, increasing the likelihood that migration will persist unless fundamental structural insecurities are resolved. Crucially, the results indicate that political unrest and economic or environmental factors drive migration, whereas improvements in income, food production, and political stability may also promote migration by providing the resources necessary to fund it. This implies that migration is not only a response to crisis but frequently a component of broader livelihood strategies.

Policy implications highlight the need for strategies to treat migration as a human security and development concern rather than merely a border-control issue. Governments should focus on strengthening governance frameworks, averting conflict, and fostering trust in institutions, as reduced political instability can reduce forced migration. Concurrently, investing in climate resilience, through drought prevention, climate-smart farming, and improved adaptation strategies, can safeguard rural livelihoods and reduce displacement driven by environmental factors. Enhancing community resilience depends significantly on improving food security through increased agricultural productivity, better nutrition, and investment in rural infrastructure. Inclusive economic development, job creation, and social protection initiatives are equally significant, as they address the economic vulnerabilities that drive distress migration, while acknowledging that higher incomes can initially enhance individuals' ability to migrate.

The research emphasises the importance of effectively coordinated migration governance that incorporates human security considerations and aligns with regional frameworks such as the African Union's Migration Policy Framework for Africa and Plan of Action (2018 – 2030). Given factors that transcend borders, regional collaboration among organisations such as the Economic Community of West African States, the South African Development Community, and the East African Community is crucial. In the end, effective migration management in SSA requires policies that reduce core vulnerabilities, enhance resilience, and ensure that, when migration occurs, it is safe, organised, and rooted in regional development needs rather than insecurity or desperation.

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Not applicable

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Conflict of Interest

The authors declare that they have no known conflicts of interest.

Data Availability Statement

All data used in this paper are publicly available.

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