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THE IMPACT OF GOOD GOVERNANCE ON FOOD SECURITY IN SUB-SAHARAN AFRICAN COUNTRIES

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ABSTRACT

Good governance is essential for both economic development and food security, which hinges on the availability, affordability, and safety of food which are vital for people's livelihoods. When governance falters, food systems ranging from production to storage, processing, distribution and even consumption tend to be disrupted. This study analysed how various governance factors, assessed through indicators like voice and accountability, political stability, absence of violence and terrorism, control of corruption, government effectiveness, regulatory quality, and rule of law, affect food security in sub-Saharan Africa. Cross-country panel data sourced secondarily from 28 countries and a System Dynamic Panel Data Estimation Technique were used for the study. The result of the descriptive statistics revealed that food security achieved the highest mean value among the analysed variables. Additionally, a pairwise correlation matrix indicated significant positive relationships between food security and factors such as voice and accountability, political stability, control of corruption, government effectiveness, regulatory quality, and rule of law in sub-Saharan Africa. Results of the regression analysis indicated that government effectiveness, political stability, absence of violence and terrorism, regulatory quality, and adherence to the rule of law positively correlated with food security, aligning with anticipated hypotheses. However, indicators like voice, accountability, and control of corruption had negative impacts. The significant link between government effectiveness and past levels of food security highlights the importance of robust governance systems, particularly within institutions responsible for food supply. Enhancing governance frameworks, especially those involving agencies tasked with making food available and affordable, is essential. Addressing the impacts of climate change on these systems is also crucial. Empowering citizens and involving them in the design and implementation of food production initiatives is key. Ensuring transparency, accountability, and openness across all institutions involved in food security, while tackling corruption in the food supply chain, must be prioritised. Sustained peace-building efforts and support for conflict-affected nations are vital for regional stability and improved food security.

Key words: food, food security, governance, panel data, system dynamic analysis, sub-Saharan Africa

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INTRODUCTION

Food security is determined by the availability, accessibility, affordability, nutritional quality, safety, and sustainability of food. These factors are influenced by food production, storage, processing, distribution, labour, pricing/inflation, economic policies, exchange rates, and individual purchasing power. In recent years, good and effective governance has emerged as a critical factor in achieving food security, particularly for Sustainable Development Goal (SDG) 2 (Zero Hunger) by 2030 [1–3]. Effective governance for food security depends on social, economic, and political frameworks, as well as collaborative planning to ensure fair and sustainable resource distribution [4].

Unfortunately, many sub-Saharan African (SSA) countries face governance challenges that contribute to conflicts, climate change impacts, natural resource depletion, and financial constraints. Historical legacies, underinvestment in irrigation, rapid population growth, economic instability, poor infrastructure, and ineffective policies further exacerbate these issues. Import restrictions on food have also worsened food insecurity [5–14]. Countries such as Ethiopia, Madagascar, Mozambique, Zimbabwe, and Malawi have been particularly affected. For example, Ethiopia suffered severe droughts in the 1980s, Madagascar endured a three-decade drought, including the 2016 El Niño-induced crop failures, and in March 2019, Cyclone Idai caused widespread destruction and humanitarian crises in Mozambique, Zimbabwe, and Malawi [15].

Poor governance in SSA has not only deepened food insecurity but also increased poverty, inequality, malnutrition, infant and maternal mortality, and reduced life expectancy, which reflect declining quality of life. As shown in Table 1, SSA has the highest rates of infant/maternal mortality and malnutrition globally, along with the lowest life expectancy at birth compared to other regions.

To positively influence food security, studies suggest that governance policies must address both supply and demand aspects. Supply-side governance involves policies supporting agriculture and nutrition stakeholders, while the demand-side governance ensures stakeholder engagement, rights protection, political participation, and accountability in food value chains [18].

Based on this postulation, several countries have successfully integrated good governance principles into agriculture and nutrition policies: Niger's "3N Initiative" (Nigeriens Nourish Nigeriens) invests in infrastructure and decentralized food security authorities at 255 sites. Brazil established a dedicated ministry to coordinate food/nutrition goals, working closely with civil society. Senegal and Bolivia have improved farmer participation and value-chain access through inclusive policies [18].



Recent research highlights governments prioritizing the “right to food” in their food security agendas, aligning with the International Covenant on Economic, Social, and Cultural Rights (ICESCR). Examples include Guatemala and Timor-Leste, which implemented laws significantly improving child nutrition, and the Dominican Republic, which enacted the 2016 Law for Food and Nutrition Security and Sovereignty to ensure adequate food access [19].

The objective of this study, therefore, is to examine the impact of good governance on food security using cross-country panel data from 28 SSA nations and a System Dynamic Panel Data Estimation technique.

MATERIALS AND METHODS

The Variables and Data Sources

This study examined two key variables: good governance and food security.

Governance

Governance refers to the establishment of rules and provision of public goods by the government [20]. It encompasses the exercise of political, economic, and administrative authority to manage a country’s affairs, including the systems, processes, and institutions through which decisions are made and conflicts resolved [21–23].

When governance adheres to principles such as participation, transparency, accountability, inclusion, and efficiency, it becomes “good governance”, a framework that promotes fairness and effectiveness in public administration [23, 24].

For this study, governance was measured using the following indicators: voice and accountability, control of corruption, government effectiveness, political stability, absence of violence/terrorism, regulatory quality and rule of law [25, 26].

Food Security

Food, in this context, is defined as a substance that provides energy and essential nutrients for bodily functions, tissue repair, and organ regulation [27, 28]. Security, meanwhile, refers to safety, freedom from fear or deprivation, and consistent access to necessities [29].

Combining these concepts, food security entails sustainable and equitable access to affordable and nutritious food to meet dietary needs and support overall health and well-being [2, 6]. As illustrated in Table 2, the Food Security Index in this study was calculated using metrics related to: availability, affordability, nutritional quality and safety, sustainability and adaptation [30].

Moderating Variables

The study incorporated several moderating factors that interact with governance to influence food security outcomes. These variables include agricultural land use, rainfall availability, access to infrastructure (particularly electricity), agricultural employment, human capital development and national wealth. These variables form a synergistic vector that shapes the relationship between governance and food security (see Lewis-Beck, Bryman & Liao cited in 'Social Science Research Reporting' [31]).

To test this framework, the study analyzed cross-country panel data from 28 sub-Saharan African nations (2017–2022) (see Appendix 1). Data were sourced from the World Bank's Worldwide Governance Indicators [25, 32], World Bank Development Indicators [16], UNDP [33] and Economist Intelligence Unit's Global Food Security Index [30].

Model Specification and Estimation Techniques

This study employed the System Dynamic Panel Data Estimation technique, utilizing an approach based on the dynamic panel estimation methods developed by Arellano and Bond and Arellano and Bover [34–38]. This methodology is particularly suited for datasets characterized by: (i) a panel structure with few periods and many individual units (small T and large N); (ii) a linear functional relationship featuring a dynamic left-hand variable dependent on its past realizations and right-hand variables that are not strictly exogenous; correlated with past and possibly current realizations of the error fixed individual effects, implying unobserved heterogeneity and heteroskedasticity and autocorrelation within individual units' errors, but not across them. The technique also addresses several econometric challenges common in panel data analysis, particularly the potential endogeneity of explanatory variables through the use of appropriate instrumental variables.

The system dynamic panel model, as stipulated above, is represented as follows:

$$y_{it} = \alpha y_{it-1} + x_{it} + u_{it} \quad (1)$$

y_{it} = dependent variable

y_{it-1} = lag of the dependent variable

x_{it} = vector of independent variables

u_{it} = error term

By incorporating the variables of good governance and food security into equation (1), the model was modified as follows:

$$IdFSe_{it} = f (IdFSe_{it-1} + GGv_{it} + VCV_{it}) \quad (2)$$

$$GGv_{it} = (VAc_{it}, CCr_{it}, GEf_{it}, PSt_{it}, RQu_{it}, RLa_{it}) \quad (3)$$

$$VCV_{it} = (AgL_{it}, LgRa_{it}, Infr_{it}, EAg_{it}, Hca_{it}, LgNW_{it}) \quad (4)$$



When equations (3 and 4) are substituted into equation (2), they then provide us with the main equation as follows:

$$IdFSe_{it} = (IdFSe_{it-1}, VAc_{it}, CCr_{it}, GEf_{it}, PSt_{it}, RQu_{it}, RLa_{it}, AgL_{it}, LgRa_{it}, Infr_{it}, EAg_{it}, Hca_{it}, LgNW_{it}) \quad (5)$$

When equation (5) was transformed into a multiple linear regression equation, the model thus became:

$$IdFSe_{it} = \beta_0 + \beta_1 IdFSe_{it-1} + \beta_2 VAc_{it} + \beta_3 CCr_{it} + \beta_4 GEf_{it} + \beta_5 PSt_{it} + \beta_6 RQu_{it} + \beta_7 RLa_{it} + \beta_8 AgL_{it} + \beta_9 LgRa_{it} + \beta_{10} Infr_{it} + \beta_{11} EAg_{it} + \beta_{12} Hca_{it} + \beta_{13} LgNW_{it} + z_{it} \quad (6)$$

By disaggregation, six other models were specified and estimated for each of the indicators of governance (voice and accountability, political stability, absence of violence and terrorism, control of corruption, government effectiveness, regulatory quality, and rule of law) as follows:

$$IdFSe_{it} = \beta_0 + \beta_1 IdFSe_{it-1} + \beta_2 VAc_{it} + \beta_3 AgL_{it} + \beta_4 LgRa_{it} + \beta_5 Infr_{it} + \beta_6 EAg_{it} + \beta_7 Hca_{it} + \beta_8 LgNW_{it} + z_{it} \quad (7)$$

$$IdFSe_{it} = \beta_0 + \beta_1 IdFSe_{it-1} + \beta_2 CCr_{it} + \beta_3 AgL_{it} + \beta_4 LgRa_{it} + \beta_5 Infr_{it} + \beta_6 EAg_{it} + \beta_7 Hca_{it} + \beta_8 LgNW_{it} + z_{it} \quad (8)$$

$$IdFSe_{it} = \beta_0 + \beta_1 IdFSe_{it-1} + \beta_2 GEf_{it} + \beta_3 AgL_{it} + \beta_4 LgRa_{it} + \beta_5 Infr_{it} + \beta_6 EAg_{it} + \beta_7 Hca_{it} + \beta_8 LgNW_{it} + z_{it} \quad (9)$$

$$IdFSe_{it} = \beta_0 + \beta_1 IdFSe_{it-1} + \beta_2 PSt_{it} + \beta_3 AgL_{it} + \beta_4 LgRa_{it} + \beta_5 Infr_{it} + \beta_6 EAg_{it} + \beta_7 Hca_{it} + \beta_8 LgNW_{it} + z_{it} \quad (10)$$

$$IdFSe_{it} = \beta_0 + \beta_1 IdFSe_{it-1} + \beta_2 RQu_{it} + \beta_3 AgL_{it} + \beta_4 LgRa_{it} + \beta_5 Infr_{it} + \beta_6 EAg_{it} + \beta_7 Hca_{it} + \beta_8 LgNW_{it} + z_{it} \quad (11)$$

$$IdFSe_{it} = \beta_0 + \beta_1 IdFSe_{it-1} + \beta_2 RLa_{it} + \beta_3 AgL_{it} + \beta_4 LgRa_{it} + \beta_5 Infr_{it} + \beta_6 EAg_{it} + \beta_7 Hca_{it} + \beta_8 LgNW_{it} + z_{it} \quad (12)$$

The description, measurement and a-priori expectation of the variables as stated in equation (4) are shown in Table 2.

RESULTS AND DISCUSSION

Table 3 presents the descriptive statistics for good governance and food security indicators across sub-Saharan Africa, while controlling for key moderating variables: agricultural land use, rainfall patterns, infrastructure access (particularly electricity), agricultural employment, education levels (measured by expected years of schooling), and national wealth.

The analysis revealed that the mean score of food security is 39.08, and its minimum and maximum values ranged between 26 and 61.7, which are higher and significant

when compared to other indicators of governance. Voice and accountability showed the highest mean (32.76) but with wide variability (2.26-71.01). Political stability and absence of violence recorded the poorest performance (mean=24.66; range=1.42-88.21).

The analysis reveals consistently low mean values across all governance indicators, indicating substantial deficits in both food security and governance quality throughout sub-Saharan Africa. While the observed ranges demonstrate significant country-to-country variation, the central tendency confirms systemic challenges in these critical development areas. These challenges stem from multiple interrelated factors such as political instability, weak institutional frameworks, inadequate infrastructure development, chronic supply shortages, price inflation driven by supply constraints, reduced workforce productivity, over-reliance on subsistence farming and erratic rainfall patterns.

Table 4 presents the correlation analysis between governance indicators and food security in sub-Saharan Africa, controlling for key moderating variables (agricultural land use, rainfall availability, access to infrastructure services (particularly electricity), agricultural employment, human capital development and economic prosperity).

The results demonstrate statistically significant positive correlations between all governance indicators (voice and accountability, political stability, absence of violence/terrorism, control of corruption, government effectiveness, regulatory quality, and rule of law) and food security. However, the strength of these relationships was weaker than theoretical expectations would predict.

Several factors, such as weak institutions linked to governments' lack of capacity to enforce policies (for example, land reforms and price controls) effectively, climate variability (rainfall dependency), poor infrastructure, low human capital, conflict and instability likely contribute to this attenuated relationship.

Table 5 presents the System Dynamic Panel Data Estimation results examining the impact of good governance on food security in sub-Saharan Africa. Model 1 (representing Equation 6) incorporates all study variables while holding the vector of moderating variables constant. The analysis reveals that the coefficient values of the lagged food security, government effectiveness, political stability, absence of violence and terrorism, regulatory quality, and rule of law had the expected signs as stipulated by the a-priori expectations. There were exceptions for the voice, accountability, and control of corruption. Only lagged food security and government effectiveness were statistically significant at the 1 per cent level.

Contrary to theoretical expectations, the analysis revealed that voice, accountability, and control of corruption did not demonstrate statistically significant contributions to food security improvements in sub-Saharan Africa, as evidenced by their unfavourable coefficient values put at -0.11 and -0.14, respectively.

The magnitude of standardized coefficients highlights government effectiveness ($\beta = 0.377$) as the most influential governance factor, suggesting that a 1 percentage point improvement in government effectiveness correlates with a 37.7 per cent increase in food security outcomes. The rule of law emerged as the second most impactful variable ($\beta = 0.240$), though with approximately 36 per cent less explanatory power than government effectiveness.

The decomposition of governance components across Models 2-6 (corresponding to Equations 7-13) yielded the following findings: (i) only voice and accountability showed results contrary to initial expectations (as evidenced in Model 2); and (ii) government effectiveness, political stability, absence of violence and terrorism, regulatory quality, and rule of law all exhibited the anticipated positive trends. Although the signs were positive, their coefficient values were too marginal to significantly impact food security in sub-Saharan Africa. Government effectiveness demonstrated the strongest practical impact as shown in Model 4 coefficient: 0.408 ($p < 0.01$), which suggests that a one percentage point improvement in government effectiveness is associated with a 40.8 per cent increase in food security.

The analysis revealed several key governance factors that strengthen food security systems throughout the sub-region. These critical indicators include government effectiveness, regulatory quality, political stability, absence of violence and terrorism, and the rule of law. These elements are fundamentally interconnected with participatory governance processes, responsive planning mechanisms, and evidence-based policy implementation in food security systems. Improvements in the judicial systems, effective economic integration within sub-regional blocs, the establishment of the African Continental Free Trade Area (AfCFTA), and the formation of global partnerships were also instrumental in enhancing the overall stability, food security and well-being of some of the countries. These partnerships span across economic, political, and military spheres. These governance advancements have collectively contributed to improved stability, enhanced food security outcomes, and better quality of life in participating nations, as supported by research from FAO, IDD/L/CSPB, and CECCOIC [4, 18, 19, 39].

Studies have also shown that since the 1990s, many sub-Saharan African nations have made progress in political and economic governance, marked by greater economic liberalization and more competitive electoral processes. These

advancements have contributed to enhanced development outcomes (for example, poverty reduction and service delivery), stronger democratic institutions (for example, accountability mechanisms and civil society engagement) and declines in systemic instability (for example, fewer coups and civil conflicts). Critically, these governance improvements have also positively influenced food security. A linkage supported by scholars such as Fosu, Simard and Viseth; and Anheier *et al.* [40, 41, 42].

Despite regional progress, significant obstacles remain in achieving meaningful voice, accountability, and corruption control across sub-Saharan Africa. These governance shortfalls stem primarily from institutional stagnation, authoritarian governance structures, systemic corruption networks, climate adaptation gaps and recurring climate shocks, economic management deficiencies, chronic insecurity (for example, communal/sectarian violence), leadership deficits for example, ineffective policy implementation) and absence of reform commitment among political elites. These deficiencies are particularly evident in crisis-affected states like the Central African Republic, Eritrea, Somalia, and South Sudan, where governance failures continue to exacerbate both food insecurity and broader development stagnation. These findings corroborate the scholarly consensus represented by Abdi *et al.*, Huang, Kłosowicz and Mbaku, whose work collectively demonstrates how institutional weaknesses perpetuate governance deficits in fragile states [13, 43, 44, 45].

CONCLUSION AND RECOMMENDATIONS FOR DEVELOPMENT

This study investigated the impact of good governance on food security in sub-Saharan Africa, operationalizing food security through a composite index encompassing availability, affordability, nutritional quality, food safety, and sustainability/adaptation. The analysis focused on seven governance dimensions: voice and accountability, corruption control, government effectiveness, political stability, absence of violence and terrorism, regulatory quality, and rule of law. Key moderating variables [including agricultural land use, rainfall patterns, infrastructure access (particularly electricity), agricultural employment, human capital, and the wealth of the nations] were controlled for in the analysis.

The descriptive analysis showed food security had the highest average score across all variables examined. Correlation analysis further revealed strong positive associations between food security and several governance indicators such as political stability, government effectiveness and regulatory quality.



The results of the regression analysis showed that government effectiveness, political stability, absence of violence and terrorism, regulatory quality, and rule of law were positively associated with food security, consistent with expectations. In contrast, voice, accountability, and corruption control had negative effects. The strong connection between government effectiveness and historical food security levels underscores the critical role of strong governance systems (especially those managing food supplies) in sub-Saharan Africa.

To enhance food security, governance reforms must prioritize strengthening key institutions, particularly Ministries of Agriculture, Water Resources, Energy, and Rural Development, responsible for ensuring food availability and affordability. These agencies must also develop robust climate adaptation strategies.

Ensuring public participation in food security initiatives is critical. All governing institutions, including executive, legislative, judicial, bureaucratic, and civil society bodies, must operate with full transparency and accountability to guarantee accessible, affordable food.

Governments and agencies must prioritize combating corruption across food systems to protect vulnerable populations. The African Union and regional blocs should sustain current peace efforts and conflict mediation in war-affected areas.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

Table 1: Selected Indicators of Quality of Life in sub-Saharan Africa and Other Regions of the World

Region	GNI Per Capita (\$) 2023	Infant Mortality Rate per 1000 live births 2022	Maternity Mortality Rate per 1000 aged 15 – 59 2020	Prevalence of Under-nutrition (%) 2021	Poverty Rate at less than \$2.15 a day at 2017 purchasing power adjusted prices (%) 1992 - 2023	Life Expectancy at Birth Total (Years) 2022	HDI 2022 ^b
East Asia & Pacific	25,050	14.5	74.0	3.9	1.0	77	0.704
Europe & Central Asia	49,423	7.5	13.0	2.7	0.5	78	0.802
Latin America & Caribbean	21,122	15.8	88.0	6.8	3.5	74	0.763
Middle East & North Africa	20,626	19.3	56.0	9.6	4.7	73	0.704
North America	79,895	6.1	20.0	2.5	-	78	-
South Asia	92,291	35.9	138.0	16.3	9.7	68	0.641
sub-Saharan Africa	4,714	70.7	536.0	21.6	36.7	61	0.549

Sources: [16, 17]



Table 2: Variable Description and Measurement: Good Governance and Food Security

Variable Name	Variable Symbol	Variable Measurement	A-Priori Expectation (Expected Sign)
Index Food Security	IdFSe _{it}	The index of food security for country i at time t. The index was derived from the components of food security that comprise food availability, food affordability, food quality and safety and food sustainability and adaptation	Dependent Variable
Lagged Food Security	IdFSe _{it-1}	Lagged value of the index of food security for country i at time t. The lagged value of the dependent variable (Index of food security) is in recognition of the fact that economic data are subjected to past values that have significant effects on the current values	(+) Indicates positive impact
Voice and Accountability	VAc _{it}	Percentage rank of voice and accountability for country i at time t	(+) Indicates positive impact
Control of Corruption	CCr _{it}	Percentage rank of control of corruption for country i at time t	(+) Indicates positive impact
Government Effectiveness	GEf _{it}	Percentage rank of government effectiveness for country i at time t	(+) Indicates positive impact
Political Stability, Absence of Violence and Terrorism	PSt _{it}	Percentage rank of political stability, absence of violence and terrorism for country i at time t	(+) Indicates positive impact
Quality of Regulations	RQu _{it}	Percentage rank of the quality of regulations for country i at time t	(+) Indicates positive impact
Rule of Law	RLa _{it}	Percentage rank of the rule of law for country i at time t	(+) Indicates positive impact
Agricultural Land Use	AgL _{it}	Agricultural land (% of land area) for country i at time t	(+) Indicates positive impact
Rainfall	LgRa _{it}	Log of Average precipitation (rain) in depth (mm per year) for country i at time t	(+) Indicates positive impact
Infrastructure	Infr _{it}	Infrastructure measured by access to electricity (% of population) for country i at time t	(+) Indicates positive impact



Employment in Agriculture	EAg_{it}	Employment rate in agriculture (% of total employment rate) for country i at time t	(+) Indicates positive impact
Human Capital Development	Hca_{it}	Human capital development is measured by the index of education (expected years of schooling) for country i at time t	(+) Indicates positive impact
Nations' Wealth	$LgNW_{it}$	Log of Nations' Wealth measured by GDP per capita PPP (constant 2021 international \$) for country i at time t	(+) Indicates positive impact
	β_0	The Intercept	
	$\beta_1, \dots, \beta_{13}$	The parameters	
	z_{it}	The error term	
	i	Denotes country 1, ..., 28	
	T	Represents the time 1, ..., 6	
	$\ln$	The logarithmic (log) transformation of some of the variables produces the best functional fit since it is used to avoid giving undue weight to some variables with extremely high scores (see Ijaiya, 2002).	

Table 3: Results of Descriptive Statistics of Good Governance and Food Security in sub-Saharan Africa

Variable	N	Mean	Std. Dev.	Min	Max
IdFSe _{it-1}	168	39.085	6.208	26	61.7
VAc _{it}	168	32.760	15.941	2.46	71.01
CCr _{it}	168	30.169	19.182	2.38	76.19
GEf _{it}	168	25.313	16.430	3.3	67.92
PSt _{it}	168	24.664	19.178	1.42	88.21
RQu _{it}	168	28.601	15.637	3.81	73.33
RLa _{it}	168	28.667	15.931	1.9	66.19
AgL _{it}	168	52.253	18.025	14.7	81.89
LgRa _{it}	168	6.797	0.6	5.02	7.83
Infr _{it}	168	44.779	21.578	8.4	90.0
EAg _{it}	168	52.328	18.228	14.89	86.31
Hca _{it}	168	10.431	2.033	5.4	19.0
LgNW _i	168	8.016	0.703	6.76	9.73

Notes: N = No. of observations, Std Dev = Standard Deviation, Min. = Minimum, Max = Maximum
 IdFSe_{it-1} = Lagged Food Security, VAc_{it} = Voice and Accountability, CCr_{it} = Control of Corruption, GEf_{it} = Government Effectiveness, PSt_{it} = Political Stability, Absence of Violence and Terrorism, RQu_{it} = Quality of Regulations, RLa_{it} = Rule of Law, AgL_{it} = Agricultural Land Use, LgRa_{it} = Rainfall, Infr_{it} = Infrastructure, EAg_{it} = Employment in Agriculture, Hca_{it} = Human Capital Development, LgNW_{it} = Nations' Wealth

Table 4: Results of the Pairwise Correlations Matrix of Good Governance and Food Security in sub-Saharan Africa

Variables	IdFSe _{it-1}	VAc _{it}	CCr _{it}	GEf _{it}	PSt _{it}	RQu _{it}	RLa _{it}	AgL _{it}	LgRa _{it}	Infr _{it}	EAg _{it}	Hca _{it}	LgNW _i
IdFSe _{it-1}	1.000												
VAc _{it}	0.568	1.000											
CCr _{it}	0.508	0.676	1.000										
GEf _{it}	0.610	0.644	0.859	1.000									
PSt _{it}	0.237	0.624	0.714	0.669	1.000								
RQu _{it}	0.580	0.694	0.833	0.915	0.697	1.000							
RLa _{it}	0.530	0.700	0.851	0.884	0.714	0.870	1.000						
AgL _{it}	0.060	0.139	0.113	0.200	0.101	0.234	0.245	1.000					
LgRa _{it}	-0.304	-0.139	-0.150	-0.193	0.092	-0.214	-0.195	0.220	1.000				
Infr _{it}	0.545	0.450	0.381	0.571	0.286	0.532	0.464	0.139	-0.025	1.000			
EAg _{it}	-0.432	-0.543	-0.451	-0.563	-0.454	-0.498	-0.448	-0.068	0.013	-0.770	1.000		
Hca _{it}	0.205	0.344	0.237	0.359	0.381	0.391	0.333	0.225	0.384	0.379	-0.422	1.000	
LgNW _i	0.490	0.499	0.437	0.581	0.426	0.598	0.477	0.053	-0.094	0.856	-0.749	0.449	1.000

Notes: IdFSe_{it-1} = Lagged Food Security, VAc_{it} = Voice and Accountability, CCr_{it} = Control of Corruption, GEf_{it} = Government Effectiveness, PSt_{it} = Political Stability, Absence of Violence and Terrorism, RQu_{it} = Quality of Regulations, RLa_{it} = Rule of Law, AgL_{it} = Agricultural Land Use, LgRa_{it} = Rainfall, Infr_{it} = Infrastructure, EAg_{it} = Employment in Agriculture, Hca_{it} = Human Capital Development, LgNW_i = Nations' Wealth



Table 5: Results of System Dynamic Panel Data Estimation of Good Governance and Food Security in sub-Saharan Africa

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
IdFSe _{it-1}	1.528*** (0.316)	1.564*** (0.289)	1.564*** (0.288)	1.405*** (0.278)	1.681*** (0.304)	1.690*** (0.301)	1.690*** (0.301)
VAc _{it}	-0.110 (0.155)	-0.0230 (0.150)					
CC _{it}	-0.194 (0.131)		0.00684 (0.120)				
GE _{it}	0.377*** (0.124)			0.408*** (0.111)			
PSt _{it}	0.0313 (0.110)				0.124 (0.105)		
RQu _{it}	0.143 (0.175)					0.238 (0.158)	
RLa _{it}	0.240 (0.160)						0.238 (0.158)
AgL _{it}	-1.193 (0.750)	-0.665 (0.671)	-0.725 (0.588)	-1.025* (0.567)	-1.201* (0.714)	-1.098* (0.639)	-1.098* (0.639)
LgRa _{it}	26.39 (23.67)	8.073 (21.19)	10.31 (19.52)	23.90 (17.77)	22.66 (21.13)	23.00 (20.15)	23.00 (20.15)
Infr _{it}	0.238 (0.159)	0.275* (0.159)	0.279* (0.158)	0.236 (0.154)	0.282* (0.162)	0.256 (0.163)	0.256 (0.163)
EAg _{it}	0.143 (0.210)	0.0381 (0.210)	0.0483 (0.204)	0.0997 (0.198)	0.0819 (0.211)	0.0780 (0.210)	0.0780 (0.210)
Hca _{it}	-0.102 (0.911)	-0.424 (0.903)	-0.461 (0.895)	-0.432 (0.861)	-0.412 (0.904)	-0.408 (0.907)	-0.408 (0.907)
LgNW _i	-3.755 (5.635)	-6.629 (5.348)	-6.608 (5.356)	-5.727 (5.201)	-4.532 (5.737)	-5.541 (5.514)	-5.541 (5.514)
Intercept	-133.6 (139.5)	4.806 (117.1)	-8.733 (106.9)	-97.78 (94.29)	-94.03 (120.8)	-96.42 (112.5)	-96.42 (112.5)
Observations	140	140	140	140	140	140	140
Sample Period	2017 to 2022	2017 to 2022	2017 to 2022	2017 to 2022	2017 to 2022	2017 to 2022	2017 to 2022
No. of time (t)	6	6	6	6	6	6	6
No. of Countries (N)	28	28	28	28	28	28	28
No. of Instruments	26	21	21	21	21	21	21

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Models 1 – 7 represent Equations 6 – 12, respectively.

Notes: IdFSe_{it-1} = Lagged Food Security, VAc_{it} = Voice and Accountability, CC_{it} = Control of Corruption, GE_{it} = Government Effectiveness, PSt_{it} = Political Stability, Absence of Violence and Terrorism, RQu_{it} = Quality of Regulations, RLa_{it} = Rule of Law, AgL_{it} = Agricultural Land Use, LgRa_{it} = Rainfall, Infr_{it} = Infrastructure, EAg_{it} = Employment in Agriculture, Hca_{it} = Human Capital Development, LgNW_i = Nations' Wealth



APPENDIX 1

List of 28 Selected Countries in sub-Saharan Africa Used for the Study

Angola	Benin	Botswana	Burkina Faso
Burundi	Cameroon	Chad	Congo DR
Côte'd Ivoire	Ethiopia	Ghana	Guinea
Kenya	Madagascar	Malawi	Mali
Mozambique	Niger	Nigeria	Rwanda
Senegal	Sierra Leone	South Africa	Sudan
Tanzania	Togo	Uganda	Zambia

REFERENCES

- 1 **Abegaz KH** Determinants of Food Security: Evidence from Ethiopian Rural Household Survey (ERHS). *Agriculture & Food Security*. 2017; **6(70)**: 0153-1 <https://doi.org/10.1186/s40066-017-0153-1>
- 2 **FAO**. The State of Food Security and Nutrition in the World: Urbanisation, Agrifood Systems Transformation and Healthy Diets Across the Rural–Urban Continuum. 2023. <https://doi.org/10.4060/cc3017en>
- 3 **UNSD**. Sustainable Development Goals (SDGs) Indicators: Global Indicator Framework for the Sustainable Development Goals and Targets of the 2030. Agenda for Sustainable Development. 2023. <https://unstats.un.org/sdgs/indicators/indicators-list/> Accessed November 2024.
- 4 **FAO**. Good Food Security Governance: The Crucial Premise to the Twin-track Approach. Workshop Report. 2011. www.fao.org/fileadmin/templates/righttofood/documents/project_ffsgovernance/workshop_report.pdf Accessed September 2024.
- 5 **Franzo J, McLaren R, Davis C and J Choufani** Climate Change and Variability: What are the Risks for Nutrition, Diets and Food Systems? International Food Policy Research Institute (IFPRI) Discussion Paper, 01645:2017. <https://www.ifpri.org/> Accessed October 2024.
- 6 **EIU**. Global Food Security Index: Exploring Challenges and Developing Solutions for Food Security Across 113 Countries; 2017. <https://impact.economist.com/sustainability/project/food-security-index/> Accessed October 2024.
- 7 **Hartley F, Gabriel S, Cullis J and C Arndt** Climate Uncertainty and Agricultural Vulnerability in South Africa. SA-TIED Working paper, 162: 2021.
- 8 **ACSS**. Conflict Remains the Dominant Driver of Africa's Spiralling Food Crises; 2022. <https://africacenter.org/spotlight/conflict-remains-the-dominant-driver-of-africas-spiraling-food-crisis/> Accessed August, 2024.
- 9 **Bjornlund V, Bjornlund H and A van Rooyen** Why Food Insecurity Persists in sub-Saharan Africa: A Review of Existing Evidence. *Food Security*. 2022; **14(4)**: 845-864.



- 10 **Haradhan KM** Food Insecurity and Malnutrition in Africa: A Combined Attempt Can Reduce Them. *Journal of Economic Development, Environment and People*. 2022; **11(1)**: 24–34. https://mpira.ub.uni-muenchen.de/112609/1/MPRA_paper_112609.pdf Accessed October 2024.
- 11 **Wudil AH, Usman M, Rosak-Szyrocka J, Pilař L and M Boye** Reversing Years for Global Food Security: A Review of The Food Security Situation in sub-Saharan Africa (SSA). *International Journal of Environmental Research and Public Health*. 2022; **19(22)**: 14836.
- 12 **Delgado C, Tschunkert K and D Smith** Food Insecurity in Africa: Drivers and Solutions. Stockholm: Stockholm International Peace Research Institute. 2023. https://www.sipri.org/sites/default/files/2023-01/2301_sipri_rpp_food_insecurity_in_africa_1.pdf Accessed October 2024.
- 13 **Abdi AH, Mohamed AA and FH Mohamed** Enhancing Food Security in sub-Saharan Africa: Investigating The Role of Environmental Degradation, Food Prices, and Institutional Quality. *Journal of Agriculture and Food Research*. 2024; **17**: 101241. <https://doi.org/10.1016/j.jafr.2024.101241>
- 14 **Minot N, Vos, R. Kim S, Park B, Zaki S and P Mamboundou** Assessing the Vulnerability of National Food Security to International Food Price Shocks: A New Index. International Food Policy Research Institute (IFPRI) Discussion Paper, (02243):2024. <https://www.ifpri.org/> Accessed October 2024.
- 15 **Eckstein D, Kunzel V and L Schafer** Global Climate Risk Index 2021: Who Suffers Most from Extreme Weather Event? 2021. www.germanwatch.org/en/cri Accessed July 2024.
- 16 **World Bank**. World Development Indicators; 2024. <https://databank.worldbank.org/source/world-development-indicators> Accessed September 2024.
- 17 **UNDP**. Human Development Index. Human Development Reports. United Nations; 2024. <https://hdr.undp.org/data-center/human-development-index> Accessed October 2024.
- 18 **IDD/L/CSPB**. Governance, Agriculture and Food Security; Undated. <https://www.fhi360.org/wp-content/uploads/drupal/documents/resource-id-governance.pdf> Accessed October 2024.

- 19 **FAO.** FAO's Work on the Right to Food; 2019. <https://www.fao.org/right-to-food/en> Accessed August 2024.
- 20 **Fukuyama F** Governance: What Do We Know, and How Do We Know It? Annual Review of Political Science, 2016; **19(1)**: 89-105. <https://doi.org/10.1146/annurev-polisci-042214-044240>
- 21 **UNDP.** Good Governance and Sustainable Human Development. UNDP Governance Policy Paper; 1997. <http://www.undp-aci.org/publications/other/undp/governance/undppolicydoc97-e.pdf> Accessed October 2024.
- 22 **Resnick D and R Birner** Does Good Governance Contribute to Pro-Poor Growth? A Review of Evidence from a Cross-Country Study. International Food Policy Institute Development Strategy and Governance Division (DSGD) Discussion Paper, (30); 2006. <https://gsdrc.org/document-library/does-good-governance-contribute-to-pro-poor-growth-a-review-of-the-evidence-from-cross-country-studies/> Accessed October 2024.
- 23 **Bojić D, Clark M and K Urban** Focus on Governance for More Effective Policy and Technical Support. 2022. <https://www.fao.org/policy-support/governance/en/> Accessed July 2024.
- 24 **Sheng YK** What is Good Governance? United Nations Economic and Social Commission for Asia and the Pacific. New York: UN. Undated.
- 25 **World Bank.** Worldwide Governance. 2022. <https://datacatalog.worldbank.org/search/dataset/0038026/Worldwide-Governance-Indicators> Accessed July 2024.
- 26 **Kaufmann D and A Kraay** Worldwide Governance Indicators. 2023. <https://www.worldbank.org/en/publication/worldwide-governance-indicators> Accessed July 2024.
- 27 **Adeyemi SL, Ijaiya GT, Ijaiya MA and BL Ijaiya** Determinants of the Right of Access to Food in sub-Saharan Africa. *African Journal of Food, Agriculture, Nutrition and Development*. 2009; **9(5)**: 1146–1160. <https://doi.org/10.4314/ajfand.v9i5.45093>
- 28 **Bowers JAR** Food. Chicago: World Book Inc. 2001.
- 29 **Merriam-Webster Dictionary Security.** Undated <https://www.merriam-webster.com/dictionary/security> Accessed July 2024.



- 30 **EIU.** Global Food Security Index; 2022.
<https://impact.economist.com/sustainability/project/food-security-index/>
Accessed July 2024.
- 31 **Ijaiya GT** Social Science Research Reporting: A Manual for Beginners. Ilorin: Unilorin Press & Publishing Company Ltd; 2013.
- 32 **World Bank.** Worldwide Governance Indicators; 2024.
<https://datacatalog.worldbank.org/search/dataset/0038026/Worldwide-Governance-Indicators> *Accessed October 2024.*
- 33 **UNDP.** Human Development Index. Human Development Reports. United Nations; various issues. <https://hdr.undp.org/data-center/human-development-index>. *Accessed October 2024.*
- 34 **Judson RA and AL Owen** Estimating Dynamic Panel Data Models: A Practical Guide for Macroeconomists. 1996.
<https://www.federalreserve.gov/pubs/feds/1997/199703/199703pap.pdf>
Accessed October 2024.
- 35 **Blundell R, Bond S and F Windmeijer** Estimation in Dynamic Panel Data Models: Improving on the Performance of the Standard GMM Estimators; The Institute for Fiscal Studies Working Paper (00/12). 2012.
- 36 **Baum CF** Dynamic Panel Data Estimators; 2013. <http://fmwww.bc.edu/EC-C/S2013/823/EC823.S2013.nn05.slides.pdf> *Accessed October 2024.*
- 37 **Kripfganz S and C Schwarz** Estimation of Linear Dynamic Panel Data Models with Time-Invariant Regressors; European Central Bank Working Paper; (1838) 2015.
<https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1838.en.pdf> *Accessed October 2024.*
- 38 **Ali HS, Zeqiraj V, Lin WL, Law SH, Yusop Z, Bare UAA and L Chin** Does Quality Institutions Promote Environmental Quality? Environmental Science and Pollution Research; 2019.26: 10446 – 10456.
<https://doi.org/10.1007/s11356-019-04670-9>



- 39 **CECCOIC.** Good Governance for Ensuring Food Security and Nutrition in the Organisation of Islamic Cooperation Member Countries; 2020.
<https://socialprotection.org/connect/stakeholders/standing-committee-economic-and-commercial-cooperation-organization-islamic> Accessed September 2024.
- 40 **Fosu AK** Governance and Development in Africa: A Review Essay. African Development Bank Group. 2018.
- 41 **Simard D and A Viseth** Three Strong Governance Performers in sub-Saharan Africa: Achievements and Way Forward In: Newiak, M., Segura-Ubiergo & Wane, A.A. (eds.). Good governance in sub-Saharan Africa: Opportunities and lessons, 47-73; 2022.
<https://www.elibrary.imf.org/display/book/9781513584058/9781513584058.xml?CODE=IMF.ORG> Accessed October 2024.
- 42 **Anheier HK, Fröhlich C and RA List** sub-Saharan Africa: Towards Better Governance and Sustainability? *Global Policy*. 2023; **14**: 124-135.
<https://www.globalpolicyjournal.com/articles/health-and-social-policy/sub-saharan-africa-towards-better-governance-and-sustainability> Accessed October, 2024.
- 43 **Huang WC** The Challenges of Good Governance and Leadership in Developing Countries. Wei-Chiao Huang, (eds.) The Political Economy of Good Governance. Kalamazoo, MI: WE Upjohn Institute for Employment Research; (131). 2015.
- 44 **Kłosowicz R** The Problem of Bad Governance as a Determinant of State Dys functionality in sub-Saharan Africa. *Politeja-Pismo Wydziału Studiów Międzynarodowych i Politycznych Uniwersytetu Jagiellońskiego*. 2018; **15(56)**: 9-22.
- 45 **Mbaku JM** Good and Inclusive Governance is Imperative for Africa's Future;2020. <https://policycommons.net/artifacts/4140695/good-and-inclusive-governance-is-imperative-for-africas-future/4949330/> Accessed August 2024.

