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# ADDRESSING POVERTY IN AFRICA: THINKING SUSTAINABILITY

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## DEDICATION

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Dedicated to the International Institute for Policy Review &  
Development Strategies for providing a platform that supports  
Institutional and Collaborative Research for Sustainable  
Development.

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## INTRODUCTION

# ADDRESSING POVERTY IN AFRICA: THINKING SUSTAINABILITY

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Poverty in Africa, despite abundant resources and potential, remains a complex and multifaceted issue. The World Bank defines poverty as an unacceptable deprivation in human well-being, which includes both physiological deprivation—such as inadequate nutrition, health, education, and shelter—and social deprivation, encompassing lack of autonomy, powerlessness, and vulnerability. In the African context, poverty goes beyond low income and touches on the lack of access to essential services and opportunities. While poverty exists across the globe, it is particularly prevalent and persistent in sub-Saharan Africa, where millions are still struggling to meet basic needs.

In Nigeria, Africa's most populous nation and often referred to as the continent's "giant," poverty remains a significant challenge. Despite numerous attempts to address it, Nigeria continues to grapple with extreme poverty. Poverty in Nigeria is measured through absolute poverty, relative poverty, and the international poverty line of \$2.15 per day. Over 11% of the world's population living in extreme poverty resides in Nigeria, indicating the severity of the issue within the country (World Poverty Clock, 2024). Despite its vast natural resources and economic

potential, Nigeria's high poverty levels underscore the need for a fresh perspective on development and poverty alleviation strategies.

### **Prevalence and Indicators of Poverty in Africa**

Poverty in Africa remains widespread, affecting millions of people in diverse ways. As of 2024, an estimated 439 million people in Africa, or about one-third of the continent's population, live in extreme poverty (World Poverty Clock, 2024). The region, particularly sub-Saharan Africa, continues to account for a significant portion of global poverty, with economic crises, political instability, and environmental challenges exacerbating the situation. The indicators of poverty in Africa include lack of access to quality healthcare, education, employment opportunities, clean water, and sanitation. Poor infrastructure, limited financial inclusion, and weak governance further deepen these challenges, making it difficult for many African countries to break the cycle of poverty. Despite numerous global initiatives, such as the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs), poverty in Africa has proven to be particularly resilient due to these interwoven challenges.

### **Government Efforts and Global Policies**

Global and regional initiatives, such as the Enhanced HIPC Initiative, SDG Fund, and land tenure reforms, have sought to address poverty in Africa by promoting debt relief, improving infrastructure, and enhancing access to financial markets. Pro-poor public expenditure, improved trade integration, and efforts to build resilience to external shocks, such as pandemics and climate-related disasters, have been crucial components of these efforts. Despite these attempts, significant barriers remain in achieving long-term, sustainable poverty reduction.

In Nigeria, from independence to date, successive governments have implemented more than 40 poverty reduction programs, ranging from Operation Feed the Nation to the more recent N-Power initiative, which focuses on employment for young people. These programs, while ambitious, have largely failed to achieve significant outcomes due to widespread corruption, poor governance, and lack of continuity in policy implementation. In addition, there has often been a disconnect between the policymakers and the reality on the ground, where those designing the policies fail to understand the local needs and the day-to-day challenges faced by the poor (Unya et al., 2022).

### **Why Nigerian Policies Have Failed**

The failure of Nigeria's poverty reduction strategies can be attributed to multiple factors. Corruption, the misallocation of resources, and poor policy execution have often led to a situation where funds designated for poverty alleviation do not reach the intended beneficiaries. Furthermore, many programs have been top-down approaches, developed without meaningful input from the communities they aim to serve. This results in programs that are ill-suited to the realities of life for those in poverty. In addition, Nigeria's heavy reliance on oil exports has limited economic diversification, making it difficult to create jobs that can absorb the growing population and provide long-term solutions to poverty.

### **Foundational Understanding of Poverty**

The foundational understanding of poverty presented in this book helps frame the complexity of the issue. Poverty is not simply the lack of money; it encompasses a wide range of deprivations, including health, education, and social inclusion. This broad perspective enables us to approach poverty reduction holistically, addressing not only economic but also social and environmental factors.

- i. Entrepreneurship and Human Capital Development:** One of the most promising pathways out of poverty is through economic empowerment and self-sufficiency. This book delves into the role of entrepreneurship, particularly in Africa's informal economy, where millions of Africans find livelihoods. Entrepreneurship holds the potential to create wealth, generate employment, and lift communities out of poverty. The book also emphasizes the need for skill acquisition, vocational training, and access to financial resources, enabling individuals to start and grow businesses. By fostering entrepreneurial spirit and building human capital, African nations can stimulate long-term economic growth that benefits a broader segment of society.
- ii. Labor Policies and Improved Work Environments:** Decent jobs and fair labor practices are essential for reducing poverty. Unemployment and underemployment, especially among Africa's youth, are major challenges. This book explores labor policies across the continent and advocates for reforms that ensure better working conditions, fair wages,

and social protection for workers. These reforms would create a more inclusive workforce, directly contributing to poverty alleviation.

- iii. **Administrative Effectiveness and Service Delivery:** Governance and administrative effectiveness are crucial in addressing poverty. Weak institutions and poor service delivery have long hindered development in Africa. This book emphasizes the importance of strengthening public administration to ensure that resources and services such as healthcare, education, and social safety nets reach those who need them most. Efficient public sector management is critical to ensuring sustainable poverty alleviation.
- iv. **Climate Change and Environmental Protection:** Africa's vulnerability to climate change significantly compounds the challenge of poverty. The book explores how climate-resilient practices in agriculture, industry, and urban planning are essential for sustainable development. Given that millions of Africans depend on agriculture, it is imperative to adopt climate-resilient farming practices to safeguard livelihoods and reduce poverty. Sustainable environmental practices are key to addressing the long-term effects of climate change on the continent's economy and people.
- v. **Technology, Innovation, and Industrialization:** Africa's future lies in its ability to leverage technology and innovation. The digital revolution offers new opportunities to tackle poverty, particularly through improved access to information, financial services, and education. This book discusses how technological innovation can drive industrialization, modernize sectors like agriculture and manufacturing, and create new markets. Through innovation, African economies can diversify, create jobs, and reduce poverty sustainably.
- vi. **Education for Self-Reliance and Employment:** Education is a powerful tool for poverty alleviation. This book advocates for reforms in education systems across Africa, focusing on equipping young people with the skills needed for self-reliance and employment. By emphasizing practical and vocational training, African countries can develop a workforce capable of driving entrepreneurial initiatives and contributing to national economic growth.

**vii. Sustainable Agriculture and Rural Development:** Agriculture remains the backbone of many African economies, but it is also one of the sectors most affected by poverty. This book proposes solutions such as the integration of small-scale farmers into larger value chains, cooperative farming, and the promotion of agroecology. By addressing rural poverty through improved agricultural practices and better market access, African countries can achieve food security and reduce poverty in rural areas.

**viii. Resource Mobilization and Sustainability:** Achieving sustainable poverty reduction will require more than just external aid. Effective resource mobilization within African countries is crucial for funding poverty alleviation programs. This book examines how African nations can harness both natural and human resources to fund development and social services, ensuring that sustainability is central to these efforts. The focus is on ensuring that today's poverty reduction strategies do not compromise future generations' ability to meet their own needs.

### **The Rationale for a Sustainable Approach**

The task of addressing poverty in Africa is undeniably complex, but it is far from insurmountable. Through a combination of economic empowerment, improved governance, technological innovation, and sustainable practices, Africa can forge a path toward poverty alleviation. This book provides both a critical analysis of the issue and practical strategies to achieve this goal, highlighting that sustainability must be at the core of any successful effort to eradicate poverty.

"Addressing Poverty in Africa: Thinking Sustainability" is a critical examination of the ongoing struggle to alleviate poverty in Africa, with a focus on sustainable solutions. This book aims to explore emerging concerns and propose new perspectives on poverty reduction, including how entrepreneurship, technology, improved governance, and climate-resilient practices can contribute to long-term development. It argues that to tackle poverty effectively, Africa needs inclusive growth, sustainable economic practices, and the empowerment of its people through education and job creation.

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CHAPTER 1

# POVERTY IN AFRICA: CAUSES, CONSEQUENCES, AND POTENTIAL SOLUTIONS

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## Abstract

**A**frica, the world's second-largest continent both in terms of landmass and population, stands as a paradox of untapped potential and enduring challenges. Amidst its breathtaking landscapes and cultural richness, it grapples with a persistent and pervasive issue: poverty. This journal article delves into the multifaceted problem of poverty in Africa, offering a comprehensive exploration of its underlying causes, profound consequences, and a range of potential solutions. Poverty in Africa is not just an economic quandary; it is a complex, interwoven issue with social, political, and historical dimensions that necessitate a nuanced understanding and collaborative efforts from both African nations and the international community.

**Keywords:** Poverty in Africa, Causes of Poverty, Consequences of Poverty, Root Causes, Political Instability, Colonial Legacy

## Introduction

Africa, with its remarkable diversity and abundance of natural resources, should be a continent poised for prosperity. However, despite these advantages, it remains home to a significant portion of the world's poorest individuals. This article seeks to shed light on the various facets of poverty in Africa and proposes

strategies to alleviate this pressing issue. Understanding and addressing poverty in Africa is not merely an ethical imperative but also essential for global stability and equitable development. Africa, a continent of astounding beauty, breathtaking landscapes, and unparalleled cultural diversity, is also a place of stark contrasts and enduring challenges. As it stretches across the equator, enveloping both arid deserts and lush rainforests, Africa bears testament to the complexity of the human experience and the vast array of ecological and social conditions that define it. Yet, beneath its resplendent natural tapestry lies an issue of profound concern: poverty. The scourge of poverty has cast a long shadow over the African continent, persisting through decades and generations. Despite being blessed with an abundance of natural resources, from mineral wealth to fertile agricultural land, Africa remains home to a significant portion of the world's most impoverished individuals. This enigma has puzzled many scholars. Scholars, policymakers, and humanitarian organizations alike sparking a relentless quest to comprehend its multifaceted dimensions and uncover strategies to alleviate its grip on the lives of millions. Poverty in Africa is not merely an economic ailment; it is a complex, multifaceted issue rooted in historical legacies, exacerbated by political challenges, and intertwined with social disparities. This article embarks on a comprehensive exploration of poverty in Africa, aiming to shed light on its root causes, intricate consequences, and a spectrum of potential solutions. It recognizes that tackling poverty in Africa is not only a matter of moral obligation but also a global imperative, for the prosperity and stability of Africa are inexorably linked with those of the wider world.

As we journey through this exploration, it is vital to acknowledge the paradox that defines Africa. This continent, known for its abundance, is simultaneously infamous for its paucity. Vast mineral reserves coexist with dire mineral governance. The cradle of humanity's rich cultural tapestry is marred by stark educational disparities. Pristine landscapes and abundant natural resources belie severe food insecurity and malnutrition. It is in this context of contradictions that we must delve into the profound issue of poverty in Africa. This article is structured to provide a comprehensive understanding of poverty in Africa. We begin by unraveling the intricate tapestry of causative factors that have contributed to its persistence. From the long shadow of colonialism to contemporary challenges of governance and economic inequality, these root causes are deeply interwoven, rendering poverty in Africa a complex web of entangled issues.



Next, we explore the far-reaching consequences of poverty in Africa. Beyond the obvious economic struggles, poverty manifests itself in myriad ways, impacting access to healthcare, educational opportunities, and political stability. The consequences of poverty reverberate through generations, trapping individuals and communities in cycles of deprivation. Having laid out the somber reality, we turn our attention to potential solutions. Africa's path to prosperity requires multifaceted strategies that address not only economic challenges but also social, political, and structural barriers. We advocate for good governance, emphasizing transparency and the eradication of corruption as foundational steps toward equitable resource distribution. Investment in education and healthcare, coupled with the diversification of economies, is essential for empowering individuals and fostering sustainable development. International collaboration and assistance must play a pivotal role in supporting African nations on their journey to combat poverty. Africa, the cradle of civilization and a continent that has contributed immeasurably to the richness of human history faces a critical crossroads in its journey toward prosperity. While its natural beauty and cultural heritage captivate the world's imagination, the enduring specter of poverty poses an urgent challenge that cannot be ignored.

As we embark on this comprehensive exploration of poverty in Africa, we must recognize that the struggle against poverty is not only about economics; it is about dignity, human rights, and the shared destiny of humanity. Africa's rich tapestry of cultures and landscapes is a testament to the resilience and vibrancy of its people. From the rolling savannahs of the Serengeti to the bustling markets of Marrakech, the continent's diversity is its strength. Yet, beneath the surface, the persistent undercurrent of poverty threatens to erode the potential and promise of this remarkable continent. It is a story of contrasts and contradictions, a tale of hope and despair, and it demands our attention and collective action. The complex nature of poverty in Africa necessitates a nuanced examination. It is a deeply rooted issue, entangled with historical legacies that span centuries. The echoes of colonialism continue to reverberate, shaping the socioeconomic landscape of many African nations. The exploitation of resources, the imposition of artificial borders, and the disruption of indigenous systems have left lasting scars. As we delve into the causes of poverty, we must not overlook this historical context, as it provides vital insights into the challenges that African nations face today. Political instability and corruption have further compounded the issue of poverty in

Africa. Diverted resources, mismanagement, and a lack of accountable governance have hindered progress and widened the gap between the privileged few and the marginalized many. In this article, we aim to dissect these challenges and illuminate the path towards accountable leadership and equitable distribution of resources.

Education and healthcare, often taken for granted in more affluent parts of the world, are elusive dreams for many Africans living in poverty. Limited access to quality education hinders skill development and perpetuates cycles of disadvantage. Similarly, inadequate healthcare services result in preventable diseases and high mortality rates, exacerbating the hardships faced by impoverished communities. Addressing these disparities is not only an ethical imperative but a strategic necessity for sustainable development. Economic inequality is another facet of poverty in Africa that cannot be overlooked. The yawning chasm between the wealthy elite and the impoverished masses is a stark reminder of the pressing need for economic transformation. African countries must diversify their economies, reducing reliance on single industries or commodities, to ensure resilience and prosperity for all. This article also underscores the critical role of international cooperation and assistance. Poverty in Africa is a global challenge with implications far beyond the continent's borders. The international community must actively support African nations in their endeavors to combat poverty, promote fair trade partnerships, provide foreign aid, and relieve crippling debt burdens. Collaboration, not exploitation, must be the guiding principle of international engagement with Africa.

## **Method**

To comprehensively examine the issue of poverty in Africa, this study employs a multidisciplinary approach that combines qualitative and quantitative methods, drawing upon a wide range of data sources and research methodologies. The research design encompasses the following key components. A systematic review of existing academic literature, reports from international organizations, and government publications provides the foundational knowledge and context for understanding poverty in Africa. This review informs the identification of root causes, consequences, and potential solutions. Statistical data related to poverty, economic indicators, healthcare access, education, and political stability are gathered from reputable sources

such as the World Bank, United Nations, African Development Bank, and national statistical agencies. These data are analyzed using descriptive statistics and regression analysis to identify trends and correlations. Qualitative data are collected through in-depth interviews and focus group discussions with key stakeholders, including government officials, policymakers, academics, non-governmental organizations (NGOs), and individuals affected by poverty in various African countries.

Thematic analysis is employed to extract insights, perspectives, and experiences related to poverty. A historical analysis of colonial legacies and their impact on contemporary poverty in Africa is conducted through archival research, document analysis, and a review of historical records. This analysis helps contextualize the root causes of poverty. Multiple case studies are conducted in selected African countries to provide a nuanced understanding of the unique challenges and contexts of poverty within different regions. These case studies involve fieldwork, interviews, and a deep exploration of local conditions. An analysis of policies and initiatives implemented by African governments and international organizations to combat poverty is conducted. This includes an assessment of the effectiveness and limitations of various poverty alleviation programs and strategies.

Comparative analysis is employed to examine poverty dynamics and interventions across different African nations, considering variations in governance, economic structures, and historical legacies. The study incorporates a global perspective by examining the role of international aid, trade, and cooperation in addressing poverty in Africa. This involves an analysis of foreign aid patterns, trade agreements, and debt relief initiatives. Ethical considerations are central to the research process, ensuring the protection of human subjects' rights and privacy, particularly in interviews and data collection involving vulnerable populations. The research team comprises experts from various disciplines, including economics, political science, sociology, and public health, fostering an interdisciplinary approach that enriches the analysis and interpretation of findings.

### **Result and Discussion**

The analysis of historical records and colonial archives reveals that the colonial era had a profound and enduring impact on the socioeconomic conditions of

African nations. Colonial powers, in their pursuit of resource extraction and exploitation, left behind a legacy of fragmented infrastructure, extractive economic systems, and deeply divided societies. These structural legacies have hindered post-independence development efforts, contributing to the persistence of poverty in many African countries. The research findings underscore the detrimental effects of political instability on poverty in Africa. Frequent coups, civil wars, and governance challenges disrupt economic activities, erode trust in institutions, and deter foreign investment. Corruption, in particular, is identified as a pervasive issue that diverts resources away from essential services and contributes to economic inequality. The quantitative analysis of education indicators confirms that limited access to quality education is a significant barrier to poverty reduction in Africa. High dropout rates, insufficient educational infrastructure, and gender disparities in education persist, limiting opportunities for skill development and employability.

The discussion highlights the urgent need for policies that promote equitable access to education and address the barriers that hinder educational attainment. The research reveals the severe health challenges faced by impoverished communities in Africa. High prevalence rates of diseases such as malaria, and HIV/AIDS, and inadequate healthcare infrastructure contribute to poor health outcomes and high mortality rates. The discussion emphasizes the importance of improving healthcare access, investing in disease prevention, and strengthening healthcare systems to address these challenges. The quantitative analysis of income distribution underscores the stark economic disparities within and among African countries. A small elite holds a disproportionate share of wealth, exacerbating poverty among the majority. The discussion delves into the implications of economic inequality, including its impact on social cohesion, political stability, and the perpetuation of poverty.

The research findings confirm that poverty contributes to widespread food insecurity in Africa. Many households struggle to access sufficient, nutritious food, leading to malnutrition and stunted growth, particularly among children. The discussion emphasizes the need for sustainable agricultural practices, food security initiatives, and social safety nets to address this critical issue. Poverty restricts access to essential healthcare services, exacerbating the burden of preventable diseases. The discussion highlights the pressing need to invest in

healthcare infrastructure, increase access to clean water and sanitation, and strengthen healthcare systems to improve health outcomes and reduce mortality rates.

The analysis of education disparities underscores the cyclical nature of poverty in Africa. Poverty limits access to quality education, leading to limited opportunities and diminished economic prospects. The discussion emphasizes the transformative potential of education in breaking the cycle of poverty and calls for targeted interventions to promote education access and quality. Poverty can fuel political instability, leading to conflicts and displacement of communities. The discussion explores the complex relationship between poverty and political unrest, emphasizing the importance of addressing economic grievances and fostering inclusive governance to mitigate conflict risks.

The research findings highlight the critical role of good governance in poverty reduction. Transparent, accountable governance can help ensure that resources are allocated equitably, corruption is curtailed, and policies are directed toward poverty alleviation. The discussion emphasizes the need for governance reforms and anti-corruption measures. The discussion underscores the transformative power of education in breaking the cycle of poverty. Investments in education, including the expansion of access, teacher training, and curriculum development, are essential to equip individuals with the skills and knowledge needed for economic empowerment.

The research findings stress the importance of expanding healthcare access and improving healthcare infrastructure. Investments in healthcare services, disease prevention, and maternal and child health are essential to reduce the burden of preventable diseases and improve overall well-being. The discussion emphasizes the necessity of economic diversification to reduce dependency on single industries or commodities. African countries must promote sustainable development across various sectors, including agriculture, manufacturing, and technology, to create diverse employment opportunities and foster economic resilience. The research findings underscore the need for international collaboration in addressing poverty in Africa. The international community should provide foreign aid, support fair trade partnerships, and offer debt relief to African nations.

The discussion calls for a collaborative approach that prioritizes African ownership of development initiatives and the alignment of international assistance with local priorities. Comparative analysis of poverty dynamics across different African nations provides valuable insights into the varied challenges and successes in addressing poverty. This section explores variations in poverty rates, economic structures, governance, and policy approaches. The research reveals that poverty rates vary significantly across African countries. Some nations have made substantial progress in poverty reduction, while others continue to grapple with high levels of deprivation. The discussion examines the factors contributing to these disparities, such as differences in economic growth rates, governance quality, and resource endowments.

A comparative analysis of economic structures highlights the importance of diversification. Countries with diverse economies that are not overly reliant on a single sector are better equipped to weather economic shocks and reduce vulnerability to poverty. The discussion underscores the role of policy in promoting economic diversification and resilience. Governance quality varies widely across African nations, with some countries experiencing greater political stability, transparency, and effectiveness in resource allocation. The discussion explores the impact of governance on poverty reduction, emphasizing the positive correlation between good governance and poverty alleviation. Different African countries employ varied policy approaches to combat poverty, ranging from targeted social safety nets to comprehensive economic reforms. The comparative analysis assesses the effectiveness of these approaches, highlighting best practices and areas for improvement. In-depth case studies conducted in selected African countries provide a granular understanding of the unique challenges and contexts of poverty within specific regions. These case studies involve fieldwork, interviews, and an examination of local conditions. The first case study focuses on a country that has made significant strides in poverty reduction. It explores the policy initiatives, governance reforms, and economic diversification strategies that have contributed to poverty alleviation. The case study also examines challenges that persist and the lessons that can be drawn for other African nations. The second case study centers on a country facing acute poverty challenges. It delves into the root causes of poverty, including historical legacies and political instability. The case study explores efforts to address poverty, assesses their effectiveness, and provides recommendations for improvement.

This section delves into the role of the international community in addressing poverty in Africa. It examines the impact of foreign aid, trade agreements, and debt relief initiatives on poverty reduction efforts. The research analyzes foreign aid patterns, including the allocation of aid to specific sectors and regions. It assesses whether aid effectively targets poverty reduction and sustainable development. An examination of trade agreements and partnerships between African nations and international trading partners sheds light on their implications for economic growth and poverty reduction. The discussion explores the potential benefits and challenges of trade liberalization. Debt relief initiatives, including the Highly Indebted Poor Countries (HIPC) program, have played a significant role in reducing the debt burdens of African nations. The research assesses the impact of debt relief on fiscal space for poverty-reduction programs. Ethical considerations remain central throughout the research process, ensuring the protection of human subjects' rights and privacy, particularly in interviews and data collection involving vulnerable populations. The discussion emphasizes the ethical imperative of poverty alleviation and the importance of a rights-based approach to development.

The Sustainable Development Goals, established by the United Nations, provide a global framework for addressing poverty and its multifaceted dimensions. This section examines how African nations are aligning their efforts with the SDGs and the progress made toward achieving these goals. A detailed analysis of progress toward SDG 1 in Africa evaluates poverty reduction strategies in light of international commitments. It explores how African countries are adapting their policies to align with this goal and the challenges they encounter. The discussion extends to SDG 2, which targets food security and the elimination of hunger. It investigates efforts to enhance agricultural productivity, ensure access to nutritious food, and promote sustainable farming practices. The research assesses the health-related aspects of poverty by examining progress toward SDG 3. It explores initiatives aimed at improving healthcare access, reducing disease prevalence, and enhancing overall well-being. Gender disparities intersect with poverty, amplifying the challenges faced by women and girls. This section delves into the gender dimensions of poverty in Africa, exploring how poverty affects women differently and examining efforts to promote gender equality. An analysis reveals that women are often disproportionately affected by poverty due to unequal access to resources, education, and economic opportunities.



The discussion explores how poverty reinforces gender inequalities and the potential for gender-sensitive policies to mitigate these disparities. The research highlights initiatives aimed at empowering women economically, socially, and politically. These initiatives include microfinance programs, girls' education campaigns, and policies promoting women's participation in decision-making. The nexus between poverty and environmental degradation is a critical concern in Africa. This section examines the impact of environmental challenges, such as climate change and resource depletion, on poverty, and explores sustainable development approaches. The research analyzes how climate change disproportionately affects impoverished communities in Africa, leading to food insecurity, displacement, and increased vulnerability. It explores adaptation and mitigation strategies that integrate poverty reduction. Sustainable management of natural resources is crucial for poverty reduction. The discussion investigates the role of community-based conservation efforts, renewable energy projects, and responsible resource extraction in fostering sustainable development.

### **Conclusion**

In the wake of this extensive exploration into the multifaceted issue of poverty in Africa, we are confronted with a profound understanding of the challenges, complexities, and opportunities that define this pressing concern. The journey through the roots, consequences, potential solutions, and broader dimensions of poverty on the continent leads us to several overarching conclusions and reflections. In the wake of this extensive exploration into the multifaceted issue of poverty in Africa, we are confronted with a profound understanding of the challenges, complexities, and opportunities that define this pressing concern. The journey through the roots, consequences, potential solutions, and broader dimensions of poverty on the continent leads us to several overarching conclusions and reflections. Despite Africa's immense potential and the strides made in some regions, poverty continues to exert a significant grip on the lives of millions. Rooted in historical legacies, compounded by political instability, and exacerbated by limited access to education and healthcare, poverty persists as a formidable adversary.

The research underscores the need to confront these deeply ingrained challenges head-on. Our investigation has revealed the interconnected nature of poverty. It is not a singular issue but a web of interrelated factors, each



exacerbating the other. Political instability affects economic growth, which, in turn, impacts education and healthcare access. Addressing poverty in Africa requires a holistic, cross-sectoral approach that recognizes these interdependencies. Good governance emerges as a linchpin in the fight against poverty. Transparent, accountable governance is essential to ensure equitable resource allocation and effective policies. Governments must prioritize governance reforms, tackle corruption, and foster institutions that promote the well-being of their citizens. Education stands out as a potent catalyst for poverty reduction. Investment in quality education not only equips individuals with skills and knowledge but also empowers them to break the cycle of poverty. Education initiatives should be accessible, inclusive, and tailored to local needs. Our research highlights the intrinsic link between poverty and health.

Insufficient access to healthcare services contributes to preventable diseases and high mortality rates, perpetuating the hardships faced by impoverished communities. The pursuit of universal healthcare access is a moral and strategic imperative. The importance of economic diversification cannot be overstated. African countries should reduce dependence on single industries or commodities and promote diverse economic activities. Sustainable resource management, renewable energy, and climate-resilient agriculture are crucial for long-term prosperity. Poverty in Africa is not a problem confined to the continent; it is a global concern. The international community must fulfill its responsibility by providing foreign aid, supporting fair trade partnerships, and alleviating debt burdens. True collaboration, based on equity and mutual respect, is the path forward. Gender disparities intersect with poverty, making it imperative to prioritize gender-sensitive policies. Empowering women economically, socially, and politically is essential for poverty reduction and sustainable development.

The nexus between poverty and environmental degradation is a critical consideration. Africa should adopt sustainable resource management practices, climate-resilient agriculture, and renewable energy solutions to mitigate environmental challenges and their impact on poverty. While poverty in Africa remains a daunting challenge, this research also illuminates stories of progress and resilience. Many African nations have made substantial strides in poverty reduction, offering hope and valuable lessons for others. These successes underscore the importance of adaptive policies, innovative approaches, and the

determination of nations and communities. In conclusion, poverty in Africa is a multifaceted issue that demands a multifaceted response. It requires the concerted efforts of African governments, international organizations, civil society, and the global community.

This research serves as a beacon, illuminating the path toward a brighter future for Africa, characterized by reduced poverty, improved living conditions, and enhanced opportunities for all its citizens. The journey to alleviate poverty in Africa is not one of mere necessity; it is a moral obligation and an opportunity to harness the continent's immense potential. It is a testament to the resilience and strength of the African people and their unwavering determination to overcome adversity. It is a shared responsibility that transcends borders and underscores our interconnectedness as a global community. As we reflect on the findings and recommendations of this research, let us recognize that poverty alleviation in Africa is not only a challenge but a promise—a promise of equity, dignity, and prosperity for all. In pursuing this promise, we honor the vision of a continent where the burdens of poverty are lifted, where opportunities are abundant, and where the full potential of Africa's diverse and vibrant societies is realized.

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CHAPTER 2

# Redefining Poverty in Africa: Theoretical Insights for Sustainable Development

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## Abstract

**P**overty in Africa is a multifaceted issue shaped by economic, social, cultural, and environmental factors. Traditional income-based measures inadequately capture the complexity of poverty on the continent. This paper explores alternative frameworks, including the capabilities approach and the Multidimensional Poverty Index (MPI), to offer a more holistic understanding of poverty. The historical context, particularly colonial legacies, and post-independence policies has entrenched inequalities, further complicating poverty reduction efforts. Case studies from Ethiopia, Nigeria, South Africa, and Kenya illustrate the diverse manifestations of poverty and the need for sustainable, inclusive development strategies. By integrating these perspectives, this paper advocates for a redefinition of poverty in Africa that accounts for its unique socio-economic realities and promotes equitable, long-term development.

**Keywords:** Poverty, Africa, Sustainable Development, Multidimensional Poverty Index, Capabilities Approach.

## Introduction

Poverty in Africa has been a persistent issue, often characterised by widespread deprivation, economic inequality and social exclusion. Traditional approaches to poverty have largely focused on income-based measures, which, while

important, fail to capture the full complexity of poverty as experienced across the continent. This narrow focus overlooks the multifaceted nature of poverty in Africa, where social, cultural and environmental factors play a significant role in shaping individuals' lives.

The conventional understanding of poverty, rooted in economic metrics such as income and consumption levels, has been critiqued for its inadequacy in addressing the diverse realities of poverty in Africa. Scholars like Sen (1999) argued that poverty should not be measured solely by income but by the absence of fundamental capabilities that enable individuals to lead lives they value. Sen's capabilities approach shifts the focus from economic wealth to the opportunities and freedoms available to individuals, offering a more holistic understanding of poverty. Similarly, the Multidimensional Poverty Index (MPI), developed by Alkire and Santos (2010), broadens the scope of poverty measurement by including factors such as education, health, and living standards. This index recognises that poverty is not just about the lack of income but also about the deprivation of basic needs and rights, which are essential for human dignity. In the African context, where poverty is deeply intertwined with historical, social and environmental factors, a multidimensional approach is crucial for understanding and addressing the issue effectively.

Africa's historical experience, particularly its colonial legacy, has profoundly shaped the continent's socio-economic landscape. The colonial period disrupted traditional systems of wealth and social organisation, imposed new economic structures, and entrenched inequalities that continue to influence poverty in Africa today (Mamdani, 1996; Rodney, 1972). The post-independence era, marked by efforts to industrialize and integrate into the global economy, further complicated these dynamics, often exacerbating poverty through policies that favored economic growth over social equity and environmental sustainability (Mkandawire & Soludo, 1999). In recent years, there has been a growing recognition that sustainable development in Africa cannot be achieved without addressing the root causes of poverty in a comprehensive manner. This requires redefining poverty to include not only economic deprivation but also social, cultural, and environmental dimensions. By adopting a broader and more nuanced understanding of poverty, policymakers and development practitioners can develop strategies that are better suited to the African context and more effective in promoting long-term sustainable development.

This chapter explores the theoretical underpinnings of poverty in Africa, critically examining both traditional and contemporary perspectives. It will argue for a redefinition of poverty that goes beyond income-based measures, incorporating insights from the capabilities approach and the Multidimensional Poverty Index. The chapter will also highlight the importance of integrating social, cultural and environmental factors into poverty reduction strategies, emphasizing the need for sustainable development that is inclusive and equitable.

### **Historical Context of Poverty in Africa**

The historical context of poverty in Africa is deeply rooted in the continent's colonial and post-colonial experiences, which have profoundly shaped its socio-economic landscape. Understanding the origins of poverty in Africa requires an examination of the pre-colonial era, the impact of European colonialism, and the challenges that emerged in the post-independence period.

#### **Pre-Colonial Africa: Indigenous Systems and Social Structures**

Before the advent of European colonialism, African societies had diverse and complex systems of governance, economy and social organisation. Many communities operated within subsistence economies that were relatively self-sufficient, with wealth often measured in terms of land, livestock, and social relationships rather than monetary wealth (Iliffe, 1987). Social structures were largely communal, with resources managed collectively to ensure the well-being of the community. The concepts of wealth and poverty were thus deeply tied to social and communal bonds rather than individual accumulation.

#### **Colonialism and the Disruption of African Societies**

The onset of European colonialism in the late 19th century marked a significant turning point in African history, leading to the widespread disruption of indigenous systems. Colonial powers imposed new economic structures that were designed to extract resources for the benefit of European economies. This included the establishment of cash crop economies, land dispossession, and the introduction of labor markets that served colonial interests (Rodney, 1972). In the seminal work "How Europe Underdeveloped Africa", Rodney (1972) argued that colonialism systematically underdeveloped Africa by exploiting its resources, distorting its economies, and creating structural inequalities that persist to this day. The colonial economy was built on the extraction of raw

materials and the export of cheap labor, which benefited the colonisers while impoverishing local populations. Traditional economies were dismantled, and African societies were forced into dependency on the colonial economy, leading to widespread poverty.

Colonial policies also entrenched social inequalities, with access to education, healthcare, and other services largely restricted to the colonial elite and those who served colonial interests. The creation of artificial borders, the imposition of new governance systems, and the exploitation of ethnic divisions further destabilised African societies, leading to conflicts and social fragmentation that have had long-lasting effects on poverty in the region (Mamdani, 1996).

### **Post-Independence Challenges and the Legacy of Colonialism**

The post-independence period brought new challenges as African nations sought to build independent states and economies. However, the legacy of colonialism created significant obstacles to development. Many African states inherited weak institutions, distorted economies, and deep social divisions that were difficult to overcome. Early post-independence development strategies often focused on rapid industrialisation and economic growth, with little attention paid to social equity or environmental sustainability (Mkandawire & Soludo, 1999).

Structural Adjustment Programs (SAPs) introduced by international financial institutions in the 1980s further exacerbated poverty in many African countries. These programs, which emphasized market liberalization, privatization and austerity, often resulted in reduced public spending on social services, leading to increased poverty and inequality (Mkandawire, 2005). The focus on economic growth without addressing the underlying social and structural issues meant that poverty remained widespread and, in some cases, deepened. The World Bank has produced various reports and datasets on poverty in Africa over the years as summarized in table 1 of the appendix section.

### **The Continuation of Structural Inequalities**

The historical processes of colonialism and post-independence economic policies have left a legacy of structural inequalities that continue to shape poverty in Africa. These include unequal land distribution, limited access to education and healthcare, and economic systems that favor elites and external



interests over the needs of the broader population. The persistence of these inequalities makes poverty in Africa not only an economic issue but also a social and political one. Understanding the historical context of poverty in Africa is essential for developing effective poverty reduction strategies. It highlights the need to address the structural causes of poverty, including the legacy of colonialism, the impact of post-independence policies, and the ongoing challenges of social inequality and economic dependency. By addressing these historical factors, there is potential to develop more sustainable and equitable development approaches that can genuinely reduce poverty across the continent.

### **Theoretical Frameworks on Poverty**

Understanding poverty requires a deep engagement with various theoretical frameworks that have been developed over time. These frameworks offer different lenses through which poverty can be analysed, each providing unique insights into its causes, characteristics, and potential solutions. In the context of Africa, where poverty is multifaceted and deeply entrenched, these theories are particularly relevant for shaping effective policies and interventions.

### **Traditional Theories of Poverty**

**The Poverty Trap Theory:** The Poverty Trap theory suggests that poverty is a self-reinforcing cycle where individuals or communities remain poor because they lack the means to improve their situation. This theory posits that those who are poor face significant barriers to escaping poverty, such as limited access to education, healthcare, and financial resources. As a result, they are unable to invest in their future, leading to a perpetuation of poverty across generations (Sachs, 2005).

In Africa, the 'Poverty Trap' is often evident in rural areas where communities are isolated and lack basic infrastructure. The absence of roads, schools, and healthcare facilities makes it difficult for people to improve their living conditions, thereby trapping them in a cycle of poverty. Jeffrey Sachs (2005), in the book *The End of Poverty*, argues that targeted investments in infrastructure, education, and healthcare are essential to breaking the Poverty Trap in such regions.

**Dependency Theory:** Dependency Theory, developed in the 1960s and 1970s, provides a critical perspective on the relationship between developed and developing countries. This theory argues that poverty in developing countries, including those in Africa, is the result of exploitative economic relationships that favor developed nations. According to dependency theorists, the global economic system is structured in a way that perpetuates the dependence of poorer countries on wealthier ones, thereby maintaining and exacerbating poverty (Frank, 1966).

André Gunder Frank (1966), a prominent advocate of 'Dependency Theory', contended that the historical exploitation of Africa through colonialism and neocolonial economic practices has created structural inequalities that keep African countries impoverished. The theory suggests that for African nations to overcome poverty, they must break free from these dependent relationships and develop self-reliant economic policies.

### **Contemporary Perspectives on Poverty**

**The Multidimensional Poverty Index (MPI):** Traditional income-based measures of poverty have been critiqued for their inability to capture the full scope of deprivation experienced by individuals. The Multidimensional Poverty Index (MPI), developed by Sabina Alkire and Maria Emma Santos (2010), offers a more comprehensive approach by assessing poverty through multiple dimensions, including education, health and living standards. Around 700 million people live on less than \$2.15 per day, the extreme poverty line. Extreme poverty remains concentrated in parts of Sub-Saharan Africa, fragile and conflict-affected areas, and rural areas (World Bank Group, 2024).

The MPI considers factors such as years of schooling, child mortality, access to clean water, sanitation, and electricity, recognising that poverty is not just about a lack of income but also about the absence of essential services and opportunities. This multidimensional approach is particularly relevant in Africa, where poverty is often linked to a lack of access to basic services. The MPI helps policymakers identify the specific deprivations that contribute to poverty and design targeted interventions to address them (Alkire & Santos, 2010).

**The Capabilities Approach:** The Capabilities Approach, pioneered by Amartya Sen, shifts the focus from income and resources to the real freedoms

and opportunities people have to live the lives they value. As posited by Sen (1999), poverty should be understood as a deprivation of capabilities, that is, the essential freedoms that allow individuals to pursue their own goals and aspirations.

Sen (1999) argued that the goal of development should be to expand people's capabilities, enabling them to lead fulfilling lives. This approach is particularly applicable in the African context, where poverty often involves more than just a lack of income. For example, a person in Africa may have a relatively stable income but still be impoverished if they lack access to quality healthcare, education, or political freedom. By focusing on expanding capabilities, development efforts can more effectively address the root causes of poverty and promote human well-being.

**Structural Inequality Theory:** Structural Inequality Theory posits that poverty is the result of systemic inequalities embedded within social, economic, and political institutions. These inequalities create and sustain disparities in wealth, power, and opportunities, leading to the marginalization of certain groups (Piketty, 2014).

In Africa, structural inequalities are often rooted in historical factors such as colonialism, as well as contemporary issues like governance failures and corruption. These inequalities manifest in unequal access to education, healthcare, and economic opportunities, which in turn perpetuate poverty. Piketty (2014), in 'Capital in the Twenty-First Century', emphasizes the role of institutional structures in creating and maintaining inequality, arguing that addressing these structures is essential for reducing poverty.

### **Integrating Theoretical Perspectives for African Development**

While each of these theoretical frameworks provides valuable insights into the nature of poverty, no single theory can fully capture the complexity of poverty in Africa. Instead, an integrated approach that combines elements from multiple frameworks is necessary to develop a comprehensive understanding of poverty and design effective interventions. For example, addressing poverty in Africa may require breaking the 'Poverty Trap' through targeted investments (Sachs, 2005), challenging dependency through self-reliant economic policies (Frank, 1966), and expanding capabilities by improving access to education, healthcare, and political participation (Sen, 1999).

Moreover, recognising the role of structural inequalities (Piketty, 2014) and adopting a multidimensional approach to poverty measurement (Alkire & Santos, 2010) can help ensure that development efforts are inclusive and equitable. By integrating these theoretical perspectives, policymakers and development practitioners can better understand the diverse and interconnected factors that contribute to poverty in Africa and develop strategies that promote sustainable and inclusive development.

### **Redefining Poverty in the African Context**

A redefined concept of poverty in Africa must extend beyond income-based measures to include social, cultural, and environmental dimensions. For instance, environmental degradation, lack of access to education and social exclusion are critical factors that contribute to poverty (UNDP, 2019). However, by adopting a multidimensional approach, we can address these factors more effectively. African conceptions of wealth and poverty often differ from Western perspectives. Many African societies value social bonds and communal participation over material possessions (Nussbaum, 2003). The concept of “Ubuntu,” which emphasises interconnectedness and communal well-being, offers a framework for understanding poverty as a collective issue rather than an individual condition (Tutu, 1999). Gender dimensions are crucial in understanding poverty in Africa. Women, especially in rural areas, face unique challenges, including limited access to education, healthcare and economic resources (World Bank, 2012). Addressing poverty effectively requires gender-sensitive policies that empower women and promote gender equality.

### **Poverty and Sustainable Development**

The relationship between poverty and sustainable development is intricate. Poverty often drives environmental degradation as the poor rely on unsustainable practices for survival, while environmental degradation exacerbates poverty by undermining resources essential for livelihoods (Barrett & Bevis, 2015). Sustainable development must address both issues simultaneously to be effective. Africa faces numerous challenges in aligning poverty reduction with sustainable development. These include high inequality levels, rapid population growth, political instability, and the impacts of climate change (Boko et al., 2007). Addressing these challenges requires integrated approaches that consider economic, social, and environmental factors. Despite these challenges, opportunities exist for creating synergies between poverty

reduction and sustainable development. For example, green economy initiatives can create jobs, reduce poverty, and promote environmental sustainability (UNEP, 2011). Investing in education and healthcare can enhance human capital, contributing to both poverty reduction and sustainable development.

Poverty in Africa has often been understood through the lens of conventional economic measures, primarily focusing on income levels and material deprivation. However, this narrow definition fails to capture the full complexity and diversity of poverty as it is experienced across the continent. To develop more effective and sustainable poverty reduction strategies, it is essential to redefine poverty in a way that reflects the unique social, cultural, and environmental realities of African societies. This redefinition involves broadening the conceptual framework to include multidimensional and context-specific factors that influence well-being and quality of life.

### **Beyond Income: A Multidimensional Approach to Poverty**

Traditional poverty measurements, such as the World Bank's \$1.90-a-day threshold, are widely used but have been criticised for their limitations in addressing the multifaceted nature of poverty (Ravallion, 2010). In the African context, where many aspects of life are not fully captured by income-based metrics, it is crucial to adopt a more holistic approach. This is where the concept of multidimensional poverty becomes significant.

The Multidimensional Poverty Index (MPI), introduced by Alkire and Santos (2010), offered a more comprehensive framework by considering various dimensions of poverty, including education, health, and living standards. This approach acknowledges that poverty is not solely about the lack of financial resources but also involves deprivation in critical areas that affect individuals' overall well-being. For instance, in many parts of Africa, lack of access to clean water, sanitation, and electricity are significant indicators of poverty, even if households have some income. Therefore, redefining poverty to include these non-monetary dimensions is essential for accurately assessing and addressing the needs of the poor.

### **The Capabilities Approach: Expanding the Definition of Well-being**

Amartya Sen's Capabilities Approach provides a theoretical foundation for

redefining poverty by focusing on what individuals are able to do and be referred to as their “capabilities” rather than just their income or possessions (Sen, 1999). As earlier argued by Sen (1999), poverty should be understood as a deprivation of basic capabilities, which can include not only economic constraints but also lack of access to education, healthcare, and the ability to participate in community life.

In the African context, where social and cultural factors play a significant role in shaping individuals' lives, the Capabilities Approach offers a more relevant framework for understanding poverty. For example, traditional communal support systems and extended family networks are critical for survival in many African societies. The erosion of these systems due to urbanisation, migration, and economic pressures can lead to social isolation and vulnerability, which are not adequately captured by conventional poverty measures. By incorporating the concept of capabilities, poverty can be redefined to include the ability to maintain social networks, cultural identity, and community participation, which are essential for well-being in many African societies.

### **Poverty, Culture and Social Exclusion**

Culture and social exclusion are important dimensions of poverty in Africa that are often overlooked in traditional analyses. Poverty is not just about economic deprivation but also involves social marginalisation and the inability to participate fully in society. This aspect of poverty is particularly relevant in Africa, where ethnic, gender, and regional disparities can significantly impact individuals' access to resources and opportunities. For instance, women in many African societies face systemic barriers to education, employment, and political participation, which contribute to their poverty and social exclusion (Kabeer, 2005). Similarly, ethnic minorities and rural populations often experience discrimination and neglect, leading to their marginalisation and impoverishment. To address these issues, poverty must be redefined to include social and cultural dimensions, recognising that the exclusion of individuals or groups from mainstream society is a critical factor in perpetuating poverty.

### **Environmental Dimensions of Poverty**

Africa's environmental context is another critical factor that needs to be integrated into the redefinition of poverty. The continent is highly vulnerable to environmental challenges, such as climate change, desertification, and natural

resource depletion, which disproportionately affect the poor (Moyo, 2010). For many African communities, livelihoods are closely tied to the environment, particularly in agriculture-dependent economies where land and water resources are vital for survival.

Environmental degradation and climate variability can exacerbate poverty by reducing agricultural productivity, increasing food insecurity, and leading to displacement and conflict over scarce resources. Therefore, a redefinition of poverty in Africa must include environmental dimensions, recognising that poverty is closely linked to ecological sustainability. Addressing environmental challenges through sustainable development practices is crucial for breaking the cycle of poverty and ensuring long-term well-being for African populations.

#### **Policy Implications: Towards a Context-Specific Definition of Poverty**

Redefining poverty in the African context has significant implications for policy and development practice. A multidimensional, capabilities-based, and context-specific understanding of poverty requires a shift in how poverty reduction strategies are designed and implemented. Policymakers need to move beyond income-based interventions and develop holistic approaches that address the diverse needs and aspirations of African communities. This includes investing in education, healthcare, and infrastructure; promoting social inclusion and gender equality; protecting cultural heritage and social networks; and ensuring environmental sustainability. By adopting a more comprehensive definition of poverty, development efforts can be more effective in creating meaningful and lasting improvements in the lives of Africa's poor.

#### **Case Studies of Poverty in Africa: Selected Countries Analysis**

Several successful initiatives illustrate how poverty reduction and sustainable development can be integrated. Ethiopia's Productive Safety Net Programme (PSNP) combines cash transfers with public works focused on environmental conservation (Berhane et al., 2014). Rwanda's Vision 2020 Umurenge Program (VUP) integrates social protection with economic development to reduce poverty. Case studies offer valuable insights into the diverse manifestations of poverty across different regions and communities in Africa. By examining specific examples, we can better understand the complex interplay of historical, social, economic, and environmental factors that contribute to poverty in various contexts. These case studies also highlight the effectiveness or lack



thereof, of different poverty reduction strategies, providing lessons for future policy and development efforts.

### **Ethiopia: Agricultural Dependency and Environmental Vulnerability**

Ethiopia is often cited as a quintessential case of poverty in Africa, where the majority of the population relies on subsistence agriculture in a challenging environmental context. The country has experienced recurring cycles of drought and famine, which have exacerbated poverty and food insecurity. As reported by the World Bank (2015), approximately 24% of Ethiopians lived below the national poverty line, with rural areas being disproportionately affected.

Ethiopia's agricultural sector is highly vulnerable to environmental changes, including erratic rainfall and soil degradation. These factors contribute to low agricultural productivity, which in turn perpetuates poverty. The Ethiopian government's efforts to modernize agriculture through initiatives like the Agricultural Growth Program (AGP) have had mixed results. While some areas have seen improvements in productivity and income, many smallholder farmers remain trapped in a cycle of poverty due to limited access to markets, credit, and modern farming techniques (Dercon & Hill, 2009).

This case highlights the importance of addressing environmental factors and supporting sustainable agricultural practices to reduce poverty in regions heavily dependent on agriculture. It also underscores the need for targeted interventions that improve access to resources and technology for smallholder farmers.

### **Nigeria: The Paradox of Resource Wealth and Poverty**

Nigeria presents a paradox where immense natural resource wealth, particularly from oil, coexists with widespread poverty. Despite being one of Africa's largest economies, Nigeria has a significant portion of its population living in poverty. As captured to the National Bureau of Statistics (2019), over 40% of Nigerians live below the poverty line, with higher concentrations in the northern regions.

The disparity between wealth and poverty in Nigeria can be largely attributed to poor governance, corruption, and the mismanagement of resources (Watts, 2004). The "resource curse" phenomenon is evident in Nigeria, where the



concentration of wealth in the hands of a few elites has led to inequality and social unrest. The Niger Delta, a region rich in oil, has become synonymous with environmental degradation, conflict, and poverty. Local communities suffer from the pollution of land and water resources, which undermines traditional livelihoods such as fishing and farming (Ikelegbe, 2005).

Efforts to address poverty in Nigeria have included the implementation of social safety nets, such as the National Social Investment Program (NSIP), and initiatives aimed at diversifying the economy beyond oil. However, the impact of these programs has been limited by structural issues, including weak institutions and inadequate infrastructure. The Nigerian case illustrates the complex relationship between natural resource wealth and poverty, highlighting the need for good governance and equitable distribution of resources.

### **South Africa: Poverty, Inequality and the Legacy of Apartheid**

South Africa's poverty landscape is deeply shaped by its history of apartheid, which institutionalized racial inequality and economic disparity. Despite being classified as an upper-middle-income country, South Africa continues to grapple with high levels of poverty and inequality. As reported by Statistics South Africa (2017), approximately 55.5% of the population lived below the national poverty line, with poverty rates significantly higher among Black South Africans compared to other racial groups.

The legacy of apartheid is evident in the spatial and economic inequalities that persist in South Africa. Black South Africans are disproportionately affected by poverty due to limited access to quality education, healthcare, and employment opportunities. The country's high unemployment rate, particularly among the youth, exacerbates the poverty problem (Seekings & Nattrass, 2005). The South African government has implemented various social policies aimed at reducing poverty and inequality, including social grants, housing programs and affirmative action policies. While these measures have had some success in alleviating poverty, structural inequalities remain deeply entrenched. The South African case demonstrates the challenges of overcoming a legacy of systemic inequality and the importance of comprehensive social and economic reforms in addressing poverty.

### **Malawi: Poverty and Health Crises**

Malawi is one of the poorest countries in the world, with the majority of its population living in rural areas and relying on subsistence farming. Poverty in Malawi is exacerbated by health crises, particularly the high prevalence of HIV/AIDS, which has had a devastating impact on the population. As reported by the United Nations Development Programme (2019), Malawi's Human Development Index (HDI) ranks among the lowest globally, with poverty and health challenges being major contributing factors.

The HIV/AIDS epidemic in Malawi has led to a decline in the labor force, reduced agricultural productivity, and increased the number of orphans and vulnerable children. This health crisis has deepened poverty, as households affected by HIV/AIDS struggle with loss of income, increased medical expenses, and social stigma (Peters, 2006). Efforts to combat HIV/AIDS in Malawi have included widespread antiretroviral treatment programs and public health campaigns, but the epidemic's impact on poverty remains profound.

Malawi's experience underscores the critical link between health and poverty, highlighting the need for integrated approaches that address both health challenges and economic development. It also points to the importance of strengthening healthcare systems and social safety nets in reducing the vulnerability of impoverished communities.

### **Kenya: Urban Poverty and Informal Settlements**

Urban poverty in Africa is often overshadowed by the focus on rural poverty, yet it presents unique challenges, particularly in rapidly growing cities like Nairobi, Kenya. Nairobi's informal settlements, such as Kibera, are home to a significant portion of the city's population, who live in conditions of extreme poverty. These settlements are characterized by inadequate housing, lack of access to clean water and sanitation, and limited employment opportunities (Amis, 2006).

The rapid urbanisation in Kenya has led to the proliferation of informal settlements as the urban poor are unable to afford formal housing. These areas are often neglected in terms of infrastructure and services, leading to poor living conditions and high levels of vulnerability. The Kenyan government's efforts to address urban poverty have included slum upgrading programs and initiatives to improve access to basic services, but progress has been slow and uneven

(Huchzermeyer, 2011). The case of urban poverty in Nairobi highlights the need for inclusive urban planning and policies that address the specific needs of the urban poor. It also emphasizes the importance of providing affordable housing and improving infrastructure in informal settlements to reduce poverty and enhance the quality of life for urban residents.

### **Policy Recommendations to Address Poverty Sustainably in Africa**

To effectively tackle poverty in Africa, it is essential to develop comprehensive, context-specific policies that address the root causes of poverty and promote sustainable development. This requires a multifaceted approach that combines economic growth with social inclusion, environmental sustainability, and good governance. Below are key policy recommendations for addressing poverty sustainably in Africa, drawing on lessons from past experiences and scholarly insights.

#### **Promote Inclusive Economic Growth**

Economic growth is a necessary but not sufficient condition for poverty reduction. To ensure that growth translates into poverty alleviation, it must be inclusive, benefiting all segments of society, particularly the poor. Policies should focus on sectors that have the highest potential to create jobs and increase incomes for the poor, such as agriculture, manufacturing and services (Collier, 2007).

**Agriculture:** Given that a significant portion of Africa's population relies on agriculture for their livelihood, investing in this sector is crucial. Policies should aim to improve agricultural productivity through access to modern farming technologies, improved seeds, fertilizers, and irrigation. Additionally, governments should support smallholder farmers by providing access to markets, credit, and extension services (Fan & Saurkar, 2008).

**Industrialization and SMEs:** Encouraging the growth of small and medium-sized enterprises (SMEs) and supporting industrialization can generate employment and stimulate economic diversification. Governments should create an enabling environment for SMEs by reducing bureaucratic barriers, providing access to finance and investing in infrastructure, such as roads, electricity, and communication networks (Page, 2012).

**Social Enterprises and Microfinance:** Encouraging social enterprises and expanding microfinance institutions can provide the poor with opportunities to start and grow businesses. These initiatives should be designed to reach the most marginalized groups, including women and rural populations (Yunus, 2003).

### **Strengthen Social Protection Systems**

Social protection systems are vital for mitigating the impacts of poverty and ensuring that vulnerable populations have access to basic needs such as food, healthcare and education. Effective social protection can help break the cycle of poverty by providing safety nets that prevent individuals from falling into extreme poverty due to shocks such as illness, unemployment or natural disasters (Barrientos & Hulme, 2008).

**Cash Transfers:** Implementing cash transfer programs, both conditional and unconditional, can provide immediate relief to the poor while also encouraging long-term investments in education, health, and nutrition. Evidence from countries like Kenya and South Africa shows that cash transfers can significantly improve the well-being of recipients and reduce poverty (Garcia & Moore, 2012).

**Universal Health Coverage:** Expanding access to healthcare through universal health coverage (UHC) can protect households from falling into poverty due to high medical expenses. Policies should focus on improving healthcare infrastructure, ensuring the availability of essential medicines and increasing the number of trained healthcare workers (WHO, 2010).

**Education and Skills Development:** Investing in education and vocational training is essential for enhancing the employability of the poor and reducing intergenerational poverty. Policies should prioritize access to quality education, especially in rural and marginalized areas, and align education systems with the needs of the labor market (UNESCO, 2014).

### **Enhance Environmental Sustainability**

Environmental sustainability is critical for long-term poverty reduction, especially in Africa, where many communities rely on natural resources for their livelihoods. Policies must address environmental degradation, climate change, and resource management to ensure that economic development does not come at the expense of future generations.

**Sustainable Agriculture:** Promote sustainable agricultural practices that protect the environment while increasing productivity. This includes encouraging agroecology, conservation agriculture, and climate-smart farming techniques that reduce the use of harmful chemicals and preserve soil health (Pretty et al., 2011).

**Renewable Energy:** Expanding access to renewable energy can help reduce poverty by providing reliable and affordable electricity to rural and underserved areas. Governments should invest in solar, wind, and hydroelectric power, and support off-grid energy solutions that are accessible to the poor (REN21, 2017).

**Natural Resource Management:** Implement policies that ensure the sustainable management of natural resources, such as water, forests, and minerals. This includes enforcing regulations to prevent over-exploitation, promoting community-based resource management and ensuring that the benefits from resource extraction are equitably shared (Bebbington, 2013).

#### **Improve Governance and Institutional Capacity**

Good governance and strong institutions are fundamental to poverty reduction. Policies must focus on improving transparency, accountability, and the rule of law, as well as strengthening the capacity of public institutions to deliver services effectively.

**Anti-Corruption Measures:** Corruption undermines development efforts and exacerbates poverty by diverting resources away from those who need them most. Governments should implement strict anti-corruption laws, strengthen oversight institutions, and promote a culture of integrity and accountability within public administration (Moyo, 2009).

**Decentralization:** Decentralizing governance can bring decision-making closer to the people, improving the responsiveness of policies to local needs. Decentralization should be accompanied by capacity building at the local level to ensure that local governments can effectively manage resources and deliver services (Ribot, 2002).

**Civil Society Engagement:** Engaging civil society organizations in the policy-making process can enhance transparency and ensure that the voices of the poor

are heard. Governments should create an enabling environment for civil society participation and support initiatives that empower communities to hold public officials accountable (Gaventa & Barrett, 2010).

### **Foster Regional Integration and Trade**

Regional integration can play a significant role in poverty reduction by enhancing trade, investment, and economic cooperation among African countries. Policies should focus on reducing trade barriers, harmonising regulations, and investing in regional infrastructure projects that facilitate the movement of goods, services, and people.

**African Continental Free Trade Area (AfCFTA):** The AfCFTA has the potential to boost intra-African trade, create jobs, and reduce poverty by creating a single market for goods and services. Governments should fully implement the agreement, focusing on removing non-tariff barriers, improving customs procedures, and supporting small businesses to take advantage of new market opportunities (UNECA, 2019).

**Regional Infrastructure Development:** Investing in regional infrastructure, such as roads, railways, ports and energy projects, can reduce trade costs and enhance connectivity between African countries. These investments should prioritise areas with high poverty rates to ensure that the benefits of regional integration are widely shared (World Bank, 2009).

### **Conclusion**

This chapter has argued for a redefinition of poverty in Africa that incorporates social, cultural, and environmental dimensions. The persistence of poverty in Africa is a multifaceted challenge that requires a comprehensive and context-specific approach to be effectively addressed. From the discussions, it is evident that sustainable poverty reduction in Africa hinges on the interplay of inclusive economic growth, robust social protection systems, environmental sustainability, good governance and regional integration. Each of these components plays a critical role in creating an environment where individuals and communities can thrive. Inclusive economic growth, particularly through investments in agriculture and SMEs, must be complemented by strong social safety nets that protect the most vulnerable. Additionally, addressing environmental challenges and promoting sustainable practices are crucial for

ensuring that development gains are not undermined by resource depletion or climate change.

Moreover, the importance of governance cannot be overstated. Effective institutions, transparency, and the rule of law are foundational to implementing the policies needed for poverty alleviation. As African countries continue to navigate the complexities of development, it is imperative that they leverage regional integration initiatives like the African Continental Free Trade Area (AfCFTA) to enhance economic opportunities and foster collaboration. By drawing on these insights and lessons, African nations can build a more resilient and inclusive future, where poverty is significantly reduced and the benefits of growth are shared by all.

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CHAPTER 3

# ADMINISTRATIVE POLICY AND POVERTY REDUCTION IN NIGERIA

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## Abstract

One of the major concerns of any government is to improve the living standard of its citizens. For this reason, every administration put up policies geared towards enhancing economic growth, redistributing income, and most importantly reducing poverty. This paper is on administrative policy and poverty reduction in Nigeria. It used descriptive analysis to ascertain how the policies and programmes of government have impacted in the life of the people. It was observed that most of the programmes implemented in Nigeria did not achieve the expected results. Though evidence showed that infant mortality rate has reduced, (from 83.2 in 2011 to 70.6 in 2021) but it is still high compared with other countries like Ghana and China. Also, life expectancy by 2022 is 61 years in Nigeria and 64 years in Ghana, while those below the poverty line in Nigeria is about 40.1 percent as against 23.4 percent in Ghana as at 2018. Other indicators such as GDP growth rate unemployment rate, etc depicts that policy measures so far employed to reduced poverty have not yielded much fruit.

**Keywords:** Poverty reduction, Fiscal policy, Administration, Economic growth.

## Introduction

Fiscal policy is widely recognized as a potent tool for enhancing growth, redistributing income, achieving high employment level and obviously

reducing poverty. Several fiscal measures introduced in Nigeria since 1986 indicated that there has been nominal growth of the Gross Domestic Product (GDP), yet poverty remains widespread and pervasive both in rural and urban areas. The formulation and proper implementation of appropriate macroeconomic policies and programmes targeted for economic growth, along with improved access to social services and infrastructures are essential ingredients for strategic poverty reduction in any economy. Such macroeconomic policies should involve the deliberate manipulation of policy instruments such as public expenditure and tax revenue among others to achieve basic macroeconomic objectives. According to World Bank report 1996, nations with inflation rates of about 30% tend to have low per capital growth, whereas those with inflation rates above 70% tend to show negative growth. Also the economic performance of the high per capital growth rate countries has been enhanced by stable exchange rates and moderate low inflation. This shows that the achievement of price stability is a valuable poverty reduction goal by itself. The report also added that, to reduce the number of people in poverty, there must be a growth rate of at least 5 – 7 percent per annum --- growth that is employment generating and with an export base. Nevertheless, growth rate in Nigeria has not been below the range stipulated by the World Bank for poverty reduction but poverty has been on the increase even as the economy records positive growth since 2009. It is clear that African countries, particularly Nigeria since the 1990's has witnessed increasing gap between the poor and the rich despite all developmental efforts made by governmental and non-governmental organizations to eradicate poverty.

The description of Nigeria as a paradox by the World Bank has continued to be confirmed by events and official statistics in the country. The paradox is that the poverty level in Nigeria contradicts the immense wealth. Poverty is also attributed to poor management of national resources, bad government, corruption and huge external debt. (In 2021, Nigeria was included among the nations that use 70% of their GAP for debt servicing), (Olufemi, 2022). It is on record that successive governments in Nigeria had embarked on various programmes (see Table 1) to enhance growth and reduce poverty but the results had been abysmal failure due to mismanagement of fund (Few examples are the activities of Petroleum Trust Fund (PTF) where billions of naira has been raised for infrastructural development across the nation and the recent billions spent on power (between 2019–2022) without tangible result. In early 2000, Adereti

identified incessant price hike of petroleum product (which made the level of inflation to be high) as a major cause of high level of poverty in Nigeria. By then the cost of fuel is below N100. But this same price of fuel has continued to increase and now 2023, it is between N550 and 650 per litter and poverty rate is on the same speed. He also observed that the degree of corruption had not changed either, but rather has been become spread across the nation.

### **Concept of Poverty**

Generally, poverty is sensed to be the lack of basic necessities of life, such as food, shelter, clothing, safety and medical care. Moreover, what is necessity to one person is not uniformly a necessity to others. Needs may be relative to what is possible and are based on social definition and past experience. Regardless of how one looks at the science of poverty, or what O'Connor calls the "knowledge of poverty", it is essential to retain focus on the fact that the definition of poverty and the policies addressing it are all shaped by political biases and values. It is the disparity of status and interest that make poverty research an inescapably political act, and exercise of power which the educated elite uses to categorize, stigmatize, but above all to neutralize the poor and disadvantaged through analysis that obscures the political nature of social and economic inequality. Considering the above statements, political agenda are the overriding factors in poverty that not only influence the choice of theory of poverty but the very definition of poverty to be explained by each theory. To Ravallion and Bidani (1994), poverty is lack of command over basic consumption needs, that is, a situation of inadequate level of consumption, and poor level of clothing and shelter. It is also said to be lack of certain capabilities, such as being able to participate with dignity in societal endeavours. In the Nigerian setting, poverty can be seen as the inability of one to provide his/her self with basic needs and therefore could not participate meaningfully in social, political and economic activities of the nation.

However, regardless of the angle one looks at poverty, it is a plague afflicting people all over the world. It is considered one of the symptoms or manifestations of underdevelopment. Poverty is a vicious cycle that keeps the poor in a state of destitution and utter disillusionment. Poverty is the main cause of hunger and malnutrition, which are aggravated by rapid population growth, policy inadequacies and inconsistencies or weak administrative capabilities.

### **The Theory of Poverty**

According to Duncan (1999) a complete explanation of why people are poor and how to eliminate or reduce the rate of poverty on the life of people would require many interrelated theories. Some of these theories are discussed below:

#### **Human Capital Theory**

This is a theory based on peoples' earning conditions. It is considered as one of the major determinants of poverty. The theory explains both individuals' decision to invest in human capital (education and training) and the pattern of individuals' lifetime earnings. The proponents of this theory, Becker and Schultz assumed that the patterns of individuals' earnings are such that they start out low (probably when the individual is young both in age and in human capital training) and increases with age and more training and experience. In other words, this theory may be explained thus: individuals' earnings depend on productivity; and productivity depends on training and experience. Therefore, if a nation fails to educate or train its citizens adequately, productivity will be low which will translate to low Gross Domestic Product (GDP) and obviously leads to poverty of individuals and the nation at large (Becker and Schultz, 1964).

#### **The Flawed Character Theory**

This theory assumes that the poor have ample opportunities for improving their economic status, but lack the initiative and diligence necessary to take advantage of them. In this theory, Bradley (1972) maintains that culture of poverty exists among a majority of the poor such that people are not psychologically geared towards taking advantage of opportunities that may come their way. It continued that, education attainment is relatively powerful in distinguishing individual with different levels of earnings, while attitudes and a simple measure of cognitive ability are not. Indeed, recent findings are showing that national and individuals' attitudes / character and cognitive ability is relatively powerful in determining the poverty rate of a nation.

#### **Restricted Opportunity Theory**

This theory contends that the poor lack sufficient access to economic opportunities and cannot avoid poverty unless their economic opportunities improve. However, Bradley (1972) opined that, the economic opportunity of the poor could only be improved by governments providing meaningful poverty reduction programmes. This means that the contribution of the government

towards poverty reduction is highly needed as this also promotes economic growth.

### **Causes of Poverty in Nigeria**

Poverty is a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go. It means insecurity, powerlessness and exclusion of individuals, households and communities (United Nations 1998). The causes of poverty have been traced in various literatures, partly to adverse developments on the international scene, world economy, foreign debt burden and series of economic reforms undertaken by developing countries, which make them not to carry out poverty prevention programmes. But the far-reaching causes are domestically based. These include inadequate production and income, lack of access to employment opportunities, poor quality of labour force, low level of technology, inefficient use of resources, location disadvantage, wars and natural disasters and the lack of access to credit and other resources. In Nigeria, the economy had contented mostly with adverse economic environment by oil shocks, world economic precession deteriorating terms of trade, excessive importation without matching export of non-oil commodities and debt overhang. These difficulties have been compounded by inappropriate and inconsistent domestic policies that aggravated macroeconomic imbalance apart from mismanagement or corruption that is inherent in the society.

### **Anti-Poverty (poverty reduction) Programmes by Nigerian Government**

The high rate of poverty level in Nigeria has led to a lot of social vices in the country such as banditry, kidnapping, hooliganism, ritual killing and theft. Thus, there is need for drastic measures to effectively reduce poverty to the lowest level in all its ramifications, if not totally eradicated. In view of this, Nigerian government has made several efforts by adopting initiatives and policies with the aim of reducing and eradicating poverty in the country and National Poverty Eradication Council (NAPEC) were instituted. Some of the programmes established before the year 2000 were as found on Table 1



**Table i: Poverty Alleviation Programmes by Successive Governments**

Programme	Year	Target group	Nature of intervention
Directorate for Food, Roads and Rural Infrastructures (DFRRI)	1986	Rural areas	Feeder roads, rural water supply and rural electrification
National Directorate of Employment (NDE)	1986	Unemployed youths	Training, finance and guidance
Better Life Programme (BLP)	1987	Rural women	Self-help and rural development programme, skill acquired and health care
People's Bank of Nigeria (PBN)	1989	The poor in rural and urban areas	Encouraging savings and credit facilities
Community Banks (CB)	1990	Rural residents, micro enterprises in urban areas	Banking facilities
Family Support Programme (FSP)	1994	Families in rural areas	Health care delivery, child welfare, youth development, etc.
Family Economic Advancement Programme (FEAP)	1997	Rural areas	Credit facilities to support the establishment of cottage industries

**Source:** Oladeji & Abiola

Also, there were anti-corruption policies or strategy measures since after the year 2000, like the establishment of specialized anti-corruption agencies (ICPC, BPP, EFCC, NEITI, etc.), reforms of public institution, privatization of the economy, support and mobilization of civil society organizations, etc. The National Economic Empowerment and Development Strategy (NEEDs) was also introduced and implemented since 2004. These policies were aimed at: raising people's living standard, increasing the real income per capita, reducing unemployment, encouraging indigenous involvement in production activity, national re-orientation and creating a strong environment for sustainable development. Unfortunately, these measures and policies could not provide the expected results as poverty continue to rise.

### **Poverty, Basic needs and Public Policy**

Basic human needs can be defined as the mainly biophysical requirements for maintaining survival; namely, the amount of food, clean water, adequate shelter, access to health services, educational opportunity, etc., to which every person is entitled by virtue of being born. These basic needs strategy adopted by the world employment conference of 1975 and confirmed by the General Assembly of the United Nations include the nation that satisfaction of the basic needs of the population must be the primary objective of development planning and of any actual development plan. According to the definition adopted by the world employment conference, basic needs embrace the regular minimum

requirement of food, housing and clothing for the individual and his family, also vital public service, especially drinking water, sanitary installation, public transport and health education facilities. The satisfaction of basic needs means meeting the minimum requirements of a family for personal consumption... It should further imply that satisfaction of needs of a more qualitative nature: a healthy, humane and satisfactory environment and proper participation in the making of decisions that affected the lives and livelihood of the people and individual freedom.

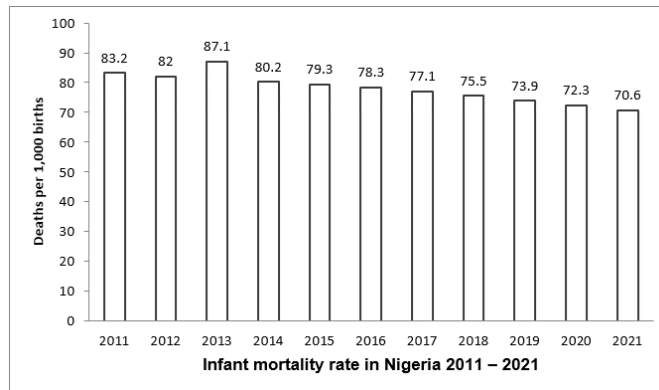
### **Social Indicators of Basic Needs**

The following social indicators, among others are usually addressed, with the aid of which the actual situation, the descend situation, the deficiency of supply in each particular case and the success of special measure in the various areas of basic needs can be determined and evaluated by:

- i. Life expectancy at birth.
- ii. Infant mortality rate.
- iii. Population per physician.
- iv. Percentage of the population with access of safe water.
- v. Daily calorie supplies per capita as percentage of requirements.
- vi. Adult literacy rate.
- vii. Number enrolled in secondary school as percentage of age group.
- viii. Number enrolled in primary school as percentage of age group.

### **Infant Mortality Rate in Nigeria**

The infant mortality rate in Nigeria decreased by 1.7 deaths per 1,000 live births (- 2.35 percent) in 2011 in comparison to the previous year. As a result, the infant mortality rate in Nigeria saw lowest number in 2021 with 70.6 deaths per 1000 live births. The infant mortality rate refers to the number of infants who do not survive past the first year of life, express as a volume per 1,000 births.

**Figure 1**

**Source:** World data info (<https://www.worlddata.info>)

### **Relationship between Corruption and Poverty**

There is widespread perception that corruption is generally the leading cause of poverty. However, there is yet no solid empirical evidence to support the hypothesis that corruption is directly responsible for poverty or major cause of poverty. Many argue that corruption is largely a symptom of poverty not its original cause. Some also believe that, it is not corruption but bad economic policies that create and entrench poverty. This school speaks about policies such as the new liberal structural adjustment programmes imposed on many countries including Africa and Nigeria in particular in the 80s and 90s.

However, many schools of thought argue that corruption has a major impact on poverty. They have attempted to establish a direct relationship between corruption and poverty and therefore maintain that corruption is the main, if not the only cause of poverty (Africa centre for economic growth). Also, some are of the opinion that, although corruption may not be directly responsible for poverty, it does fuel it. Meaning that, corruption has only an indirect effect on poverty level. Apart from the above assertions, two more prominent sub-schools are found: the first perspective advances that corruption fuels poverty through its negative effects on economic factors such as economic growth, quality of government expenditure, foreign and domestic investment, income inequality, tax and government revenues, etc. The second perspective is what is known as the governance model, which argues that a higher level of corruption reduces governance capacity; that is, the capacity of public institutions, which in turn,

increase poverty rate. Corruption also fuels poverty through a reduction of the quality and quantity of public services (education, health, housing, etc.) which benefit mainly the poor<sup>17</sup>.

### **Kinds of Corruption in Nigeria**

Nigeria has grappled with the challenges of corruption since independence in 1960. Many governments have been toppled from power after being accused of tolerating corruption or even engaging in it. From middle of 1960s, the vice gradually became systemic and it was institutionalized during the 90s, when successive non-democratic regimes tolerated or even promoted it. Some of the most common forms of corruption in Nigeria are acceptance of gratification and other forms of inducements, influence peddling, embezzlement of public funds and conflict of interest (e.g. in the award of contracts by public office holders to cronies, etc.). Others are bribery, exhortation, fraud, nepotism (e.g. in recruitment / appointment and promotion of public servants) rigging of election, etc.

### **Poverty Reduction through Increase in the Income of the Poor by Government**

The World Bank (1990, 1996), identified four major measures to increase the income of the poor:

- i. Increasing the demand and therefore the price for those factors of production that the poor own (such as labour).
- ii. Transferring physical assets such as land to the poor
- iii. Providing social services such as education (quality education) to the poor.
- iv. Transferring current income to the poor through cash or food subsidies.

Economic growth is a powerful means of reducing poverty. However, all pattern of growth does not have the same impact. Labour incentive agricultural growth is particularly important for poverty reduction (as compared to production incentives) because agriculture in Nigeria provides employment for more than 70% of the labour force in the rural areas. To achieve this, group cooperative farms need to be developed and founded at strategic villages depending on the comparative advantage of the selected communities. Also, increasing the access of the poor to land and other assets will alleviate the poverty of the masses, as they will be able to cultivate land and rear animals. Another measure will be to

enhance the access of small-scale farmers and traders to credit, this will increase their productive capabilities as they will be able to invest more on agriculture and increase food supply. Development of infrastructure in the rural areas is sine quo non to developing agriculture. Local government areas in each state can be used to pilot the programme. Such facilities like feeder roads, electricity, and irrigation are major factors that need to be provided to enhance food production. Indeed, processing and marketing of food items offer ventricular avenue for job creation. Small-scale processing facilities for cassava, yam, rice, millet, sorghum have been identified as having high absorptive capacities. Apart from the employment potentially, processing offers a value-added agricultural output thereby increasing farmers' income.

### Comparing Nigeria with some selected countries, using some measurements of poverty such as:

**GDP per capita (current US\$):** GDP per capita is Gross Domestic Product (GDP) divided by midyear population.

**Table 2: (GDP Per Capita in Current US\$)**

Country	2017	2018	2019	2020	2021	2022
Nigeria	1941.9	2125.8	2334.0	2074.6	2065.7	2184.4
Ghana	1918.7	2180.0	2167.9	2176.6	2410.7	2175.9
China	8810.0	9905.4	10143.0	10408.7	12617.5	12720.2
France	38781.0	41557.7	40494.9	39055.3	43659.0	40963.8
Germany	44652.6	47939.3	46793.7	46772.8	512036	48432.5

**Source:** World Bank National Account Data, and OECD National Accounts Data Files 2022.

### International Poverty Line – 2017.

This is poverty headcount ratio, measuring the percentage of the Population Living Below (PLB) the selected ratio: i.e. living on less than \$2.15 or..... a day.

**Table 3: International Poverty Line**

Country	PLB \$2.15 a day	PLB \$3.65 a day	PLB \$6.85 a day
Nigeria	30.9m	63.5m	90.8m
Ghana	25.2m	48.8m	78.5m
Brazil	5.8m	11.3m	28.4m
China	0.1m	3.0m	24.7m
France	0.0m	0.1m	0.1m
Germany	0.0m	0.2m	0.2m

**Source:** worlddata.info

### Quality of Life Comparison (Health, Basic needs and Economy) 2020-2022.

**Table 4: Quality of Life Comparison**

Quality of life	Nigeria	Ghana
Unemployment	42.7% of adults	37.6% of adults
Below poverty line	40.1% of the population	23.4 5 of the population
Access to electricity	62% have access to electricity	85% has access to electricity
Internet access	36% of the population	58.0% of the population
Improved drinking water	83% have access to improved drinking water	92% have access to improved drinking water
Literacy rate	62%	79%
Life expectancy	61 years	69 years

Source: worlddata.info

### Growth Rate of some Selected Nigeria's Macroeconomic indicators (2012-2021).

**Table 5: Growth Rate of some Macroeconomic Indicators.**

Year	GDP Growth Rate (%)	PCI Growth Rate (%)	Poverty Rate (%)	Life Expectancy Rate (%)	Unemployment Rate (%)	Inequality
2012	6.22	13.17	68.67	50.87	24.23	35.50
2015	4.83	0.27	72.00	52.67	25.12	35.90
2018	0.75	0.47	51.42	54.67	25.5	35.0
2021	1.25	(1.04)	40.10	53.57	30.12	35.50

Source: Baba Madu (2023).

### Discussion of Findings

From the findings of this study, it was discovered that Nigeria had embarked in many programmes in an attempt to reduce poverty. Some of these programmes/policies seem to be wonderful in their documentation, but none of them has impacted much as regards fulfilling the objective of the government towards poverty reduction. For instance, comparing Nigeria with Ghana, China, France, and Germany in terms of GDP per capita, Nigeria came last with a value below the poverty line. As well in terms of percentage of the population living below (PLB) \$2.15, \$3. 65,....a day, Nigeria has the highest number (among the same countries mentioned above) for all the margins selected. It was also observed that under quality of life between Nigeria and Ghana, using some basic needs, Nigeria was below Ghana in most of the variable selected. Finally, the

growth rates of GDP and PCI have been on the decrease since 2012. These findings will help the policy makers understand the current situation of the country.

### **Conclusion**

A proper investigation or analysis of the tables above shows that the high poverty alleviation programmes of both the state and federal government failed to meet the expectations of the people. With the beautiful and fantastic poverty reduction programmes, it may not be wrong to assume that Nigeria will compete with China or France in terms of GDP per capita or quality of life. The report from Table 5 indicates that GDP growth rate has been falling since 2012 with 2018 recording the lowest. Also, unemployment is on the increase. The indication that poverty rate decreased from 68.7% in 2012 to 40.1% in 2021 cannot be proved from the living standard of the citizens. In spite of the expressed concerns of past governments and the plethora of programmes/policies that have a bearing on poverty reduction, the incidence and scourge of poverty have worsened over the years. And the factors which have constrained the effectiveness of the programmes and policies of the government are with and from the government.

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CHAPTER 4

# SELF-RELIANCE AND SUSTAINABLE DEVELOPMENT: THE ROLE OF TECHNICAL AND VOCATIONAL EDUCATION IN ADDRESSING POVERTY

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## Abstract

**T**he term technical and vocational education (TVE) refers to a broad range of educational programmes that include, in addition to general education, the study of technologies and related sciences as well as the acquisition of knowledge and practical skills relevant to a variety of vocations in the social and economic spheres. One of TVE's primary goals is to train people in the abilities needed to produce engineers, technicians, technologists, and other skilled workers who will be independent and enterprising. In addition, technical and vocational education offers the possibility for effective in-service training, fundamental skills necessary for obtaining entry-level employment, and ongoing education and training within the framework of lifelong learning, as defined by Sustainable Development Goals 4. Strengthening and enhancing Technical and Vocational Education and Training (TVET) therefore, is necessary to achieve this goal. Against this backdrop, the paper explored the role of TVE in sustainable development and self-reliance as well as the limits to TVET in Nigeria. Data for the study were sourced through secondary information from relevant education regulatory agencies. The paper concluded by presenting collaborative efforts aimed at supporting TVET and

*presented recommendations that will increase the achievement of the aims of TVET in Nigeria.*

**Keyword:** *Technical and Vocational Education, Sustainable Development, Self-Reliance, Poverty, Employment*

## **Introduction**

One of the major challenges facing the world today is to find ways of living and working sustainably, so that the major needs and wants of people from all works of life and in all countries can be satisfied without over exploiting the natural resources upon which all life depends, without jeopardizing the ability of future generations to meet their own needs and wants (UNESCO 2016). Attaining sustainable development involves a whole range of fundamental changes in human attitudes and behavior at personal and community levels. Making these changes is critically dependent on education and training. Technical and Vocational Education (TVE) has been identified as an integral component of lifelong learning and thus, has a crucial role to play in the education paradigm shift being an effective tool for attaining the goal of sustainable development through poverty reduction (Olanipekun, Brimah and Rabiou 2015). Technical and Vocational Education and Training (TVET) have been recognized the world over as tools for empowering people, especially the youth, for sustainable livelihood and socio-economic development. Over the years, emphasis has been on general education in Nigeria and the resultant effect had been the large army of unemployed youth in the country. Because of these, there have been a renewed effort, with more emphasis on Technical and Vocational Education as a way of solving the unemployment problem and attaining sustainable development.

## **Purpose of Technical and Vocational Education (TVE)**

As enshrined in Act No. 16 of 1985 (National Minimum Standards and Establishment of Institutions); the purpose of technical and vocational education are as follows:

- i. Provision of trained manpower in engineering, applied science, technology and commerce at all professional grades;
- ii. Provision of technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development;
- iii. Provision of qualified and well-equipped personnel to apply scientific knowledge to the improvement and solution of environmental problems for use and convenience of man,

- iv. Introduction of professional studies in engineering and other technologies;
- v. Provision of training to impart the necessary skills leading to the production of craftsmen, technicians, technologist's engineers and other skilled personnel who will be enterprising and self-reliant.
- vi. To enable men and women to have intellectual understanding of the increasing complexity of technology and the role technology plays in the world around them.

The Act also provides that the National Board for Technical Education (NBTE) shall have responsibility for advising the Minister of education on the establishment of minimum standards in polytechnics, technical colleges and other technical institutions in the Federation, and shall maintain such standards. TVET is thus; an integral part of general education and serves as a means of preparing for occupational fields and effective participation in the world of work. It is also, an aspect of lifelong learning and preparation for a responsible citizenship as well as an instrument for promoting environmentally sound suitable development and as an instrument of poverty alleviation (Yusuff and Soyemi 2012). According to Ukama, Ochedikwu and Deke (2013) vocational and technical education graduates in Nigeria are expected to have a broad conceptual understanding of the structuring and functions of both the institutions of learning and industries, companies and factories which will enhance better performance, empowerment, create jobs and improve productivity in the economy. It is believed that TVE can be a means to an end because it has the capacity to be a major tool for solving the problem of unemployment through training that impact skills that fits into industry needs. Employment leads to self-reliance and enhances sustainable development (Oguejiofor and Ezeabasili 2014).

### **The Objectives of the Paper**

The objectives of this paper are; to:

- i. Examine the role of TVE in sustainable development, self-reliance; and poverty reduction
- ii. Examine the constraints to TVET in the country; and
- iii. Make recommendations that will enhance the achievement of the goals of TVET in Nigeria

## **Conceptual Clarifications**

### **Technical and Vocational Education**

The Nigerian National Policy on Education (2004) defines technical and vocational education as a comprehensive term referring to those aspects of the educational process involving in addition to general education, the study of technologies and related science and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic and social life. Technical and vocational education (TVE) is therefore, a comprehensive term referring to the educational process which involves, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills and knowledge relating to occupations in various sectors of economic and social life. The broad educational goals of technical and vocational education distinguish it from 'vocational training which is directed to developing the particular skills and related knowledge required by a specific occupation or group of occupations. When used separately, each element of this composite term takes on a restricted meaning. For instance, technical education is that branch of education, designed at upper secondary and lower tertiary levels to prepare middle-level personnel (technicians, technologists, middle management, etc.), and at university level, to prepare engineers for higher management positions. Technical education includes general education, theoretical, scientific and technical studies and related skill training. The components of technical education may vary considerably depending on the type of personnel to be prepared and the education level (Lawal, 2016).

### **Vocational Education**

Vocational education on the other hand is designed to prepare skilled personnel at lower levels of qualification for one or a group of occupations, trades or jobs. Vocational education, usually provided at upper secondary level, would include general education, practical training for the development of skills required by the chosen occupation, and related theory. The proportions of these components may vary considerably but the emphasis is usually on practical training within the framework of lifelong education.

### **Development**

The concept of development has been defined in several ways ranging from physical development to mental development, social and economic

development as well as in the well-being of individuals, a nation and the world. Development thus means different things to different people depending on the phenomenon under consideration. According to Aghenta in Adenle and Olukayode (2007); development is "any position changes, which brings about desirable benefit to the individual and society".

### **Sustainable Development**

Sustainable Development is defined in many ways. Adebola (2007) defines sustainable development as a kind of development that can be initiated and managed properly in such a way as to give attention to continuity and preservation as people explore an explicit available resource for the enlargement of their existence. On the other hand, Kudan in (Ugoh, 2008) describes sustainable development as meeting the need of the present generation without compromising the needs of future generation. The most frequently quoted definition is from the Brundtland Report (United Nations, 1987) which defines Sustainable Development as: "development that meets the need of the present without compromising the ability of the future generations to meet their own needs". This definition contains within the two key concepts:

- i. The concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given.
- ii. The idea of limitations imposed by the state of technology and social organization of the environment's ability to meet present and future needs.

Any definition of sustainable development therefore, require that it views the world as a system that connects space; and a system that connects time. This involves an understanding that pollution has the capacity to affect air quality in any location and that the decision of our grandparents on farming patterns will continue to affect farming practices of today. Thus, the key to the concept of sustainable development is the development that balances economic and social progress, address cultural differences, conform to global, national and local needs, and respect ecological values and limits (UNESCO 2012). This balance seeks therefore to promote equity between the present and the future, and equity between countries, races, social classes and genders.

### **Sustainable Development Goals**

Sustainable Development Goals (SDGs) refer to an agreement of the United Nations Conference on Sustainable Development held in Rio de Janeiro in June

2012 (Rio+20), to develop a set of future international development goals as the MDGs wind down in 2015. This proposal contains 17 goals with 169 targets covering a broad range of sustainable development issues, including ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change, and protecting oceans and forests.

### **Technical and Vocational Education and Training, Sustainable Development, Self-Reliance and Poverty Reduction**

#### **The Crucial Role of TVET**

Globally, TVET is looked at as "a learning culture" that encourages and educate people "to be productive and competitive, and to care for the well-being of its people" (United Nations, 1987). The contribution of TVET to a sustainable future is in diverse form which include:

- i. Its effectiveness to realize the global objective of a culture of peace, environmentally sound sustainable development, social cohesion and global citizenship.
- ii. TVET is expected to prepare individuals not only for the world of work, but also to make them responsible citizens who will willingly preserve the environment as well as the welfare of others.
- iii. TVET is also expected to play an instrumental role in preparing individuals for the challenge of achieving sustainable socio- economic development.
- iv. TVET for sustainable development has three pillars which are; the social dimension to TVET, the economic dimension and the environmental dimension. According to UNESCO (2012), TVET should:
- v. Contribute to the achievement of the societal goals of greater democratization and social, cultural and economic development.
- vi. Lead to an understanding of the scientific and technological aspects of contemporary civilization in such a way that people comprehend their environment and are capable of acting upon it while taking a critical view of the social, political and environmental implications of scientific and technological changes.
- vii. Empower people to contribute to environmentally sound sustainable development through their occupations and other areas of their lives.

### **Towards a Sustainable Development, Self-Reliance and Poverty Reduction in Nigeria**

A functional TVE if fully entrenched in the nation's educational system, will sustain the development of its industry, rural development, provide the required capacity building for the economy and make its citizens self-reliant in a competitive global economy. The polytechnics and other technical training institutions has the capability to provide skilled labor for environmental resources, provision of safe drinking water and basic sanitation, the development of cheap and safe materials for building houses for slum dwellers and to make available the benefit of new technologies especially in energy utilization and information and communication technologies. The development of adequate infrastructure which is required for the enhancement of the creation and application of science, technology and innovation in development, can only be possible with the entrenchment of functional TVE, whose curriculum and course specifications provides modular employable units for its candidates. The improvement required in terms of production and distribution in industry calls for increased competencies, the development of new emerging skills and the capacity to adapt productively, to the continuously changing demands of employment throughout the working life of our people. This role cannot be accomplished without a functional TVE. Nigeria and indeed Africa are blessed with abundant and precious industrial and strategic minerals, rain forest, oil and gas, untapped solid minerals and other natural features that give it an attractive tourist appeal. These sources of wealth remain largely untapped, especially the agricultural potentials. It is TVET that has the capabilities of providing the required changes and innovation that will turn around these resources into measurable wealth to meet national development objectives and poverty reduction.

### **Challenges to TVET in Nigeria**

#### **Low Carrying Capacity of TVE Institutions**

Annually over 1,000,000 applicants seek for admission into universities that can barely admit 350,000; that is to say applications for admission into universities are nearly 300% over-subscribed. The implication of these is that many applicants will opt for the polytechnics. For instance, total enrolment in Nigerian polytechnics. in the 2015/2016 session was over 320,000. This was against the backdrop of the fact that actual total carrying capacity was barely 185,370, showing over-subscription by over 100% (NBTE 2017). They are carrying twice as many students as their actual capacities which will have grave implications on the quality of graduates as shown in table 1.



**Table 1: Carrying Capacities of Tech-based non-Tech based Institutions**

Institutions	Tech based	Non-Tech based	Total
<b>Federal Polytechnics</b>	61,370 (38.8%)	18,680 (11.8%)	80,050 (50.6%)
<b>State Polytechnics</b>	52,470 (33.1%)	20,040 (12.7%)	72,510 (45.8%)
<b>Private Polytechnic</b>	2,990 (1.89%)	2,820 (1.8%)	5,810 (3.7%)
<b>Total</b>	116,830 (73.8%)	41,510 (26.2%)	158,370 (100%)

**Source:** NBTE, 2017.

### Quality and Relevance

Quality in the TVE sector is maintained through a process of accreditation of programmes enforcement of carrying capacities of institutions for accredited programmes. This is undertaken through inspection visits by teams representing the major stakeholders in the specialized areas including representatives of professional registration councils (e. g. COREN, CPN, ICAN, COBON, NIM, etc.), employers of labour, academics from universities and professional peers from the polytechnics. According to NBTE, as at January 2017, 81.3% of the programmes mounted in polytechnics were accredited, while 18.7% of the programmes with deferred or expired status were due for verification or re-accreditation as the case may be. However, the ratio of technology to non-technology-based programmes on offer in the polytechnics was 71:29. In the technical colleges however, the picture is different with only 40% of the trades accredited with obvious consequences on the quality of the products.

Another major challenge to TVET in Nigeria is the relevance of the curricula. Over 130 curricula of polytechnics and colleges of technology had been in use for many years without review or updating, some for over one decade. However, effort was made by the NBTE in conjunction with UNESCO to begin the review of which only 90 curricula have been reviewed (NBTE, 2017). The challenge therefore is to revise and update all the curricula to make them more workplace compliant in line with global trends, demand driven and responsive to market need.

**Table 2: Status of NBTE-accredited Technology and Non-Technology Programmes in Polytechnics and Monotechnics as at January 2017**

Institution by Ownership	PROGRAMME TYPE				
	Accredited	Deferred/Expired	Accredited	Deferred/Expired	Total
Federal	531 (35.1%)	60 (4.0%)	128 (8.5%)	55 (3.6%)	774 (51.2%)
State	375 (24.8%)	88 (5.8%)	150 (9.9%)	80 (5.3%)	693 (45.8%)
Private	15 (1.0%)	0 (0.0%)	31 (2.1%)	0 (0.0%)	46 (3.0%)
Total	921 (60.9%)	148 (9.8%)	309 (20.4%)	135 (8.9%)	1513 (100%)

**Source:** Funding of TVET

Funding has always been the major constraint on the development of an effective TVET system. Although official statements continue to attach importance to technical and vocational education, evidence points to the fact that commitments have not been translated to action yet. Financing TVET is also more complex than for general education: the structure of TVET with its diverse target groups, the substantial establishment and factor input costs, the greater scope for market-oriented mechanisms and linkages as well as the richer prospects for developing income-generating activities are some of the features of financing settings for TVET. In Nigeria the particular TVE training level generally determines the financing options available. Inadequate funding of institutions and their TVE programmes appear to be on the increase. Inflationary trends in the economy have also contributed to institutions inability to use the insufficient fund to provide resources for quality training. Areas most affected include: replacement of obsolete and disused equipment, provision of more modern workshop and laboratory equipment for practical exposure: provision of consumables for practical work, maintenance of existing training resources; training and retraining of teaching, laboratory and workshop staff, recruitment of more staff, and improvement of staff remuneration and other incentives. The present level of capital funding is grossly inadequate, while the personnel and other recurrent funding need improvement. While all proprietors of institutions must upgrade their funding level it is necessary that institutions expand avenues for fund generation.

### **Low Societal Estimation of Polytechnic Education and Discrimination against Polytechnic Graduates.**

Government policy in the past had not accorded polytechnic education its rightful place within the tertiary educational system of the country. This can be seen in the placement of ceiling on career progression of polytechnic staff and graduates, level of funding. Condition of service, etc. The polytechnic graduate in Nigeria finds himself discriminated against at the point of employment as well as in career progression, no matter how hard working, competent and skillful he/she is. In the event his/her organization falls into bad time and has to reduce its staff, he/she is the first to be considered for retrenchment. Similar to the academic problem, is the issue of professional recognition. Although, this appears to be more subtle as HND holders have gained parity acceptance with university graduates for entry into most professional examinations.

### **Inadequacy of Teaching Staff and Brain Drain**

Inadequate number and quality of relevant teaching staff is largely due to the fact that the sector does not produce its own teaching staff. It relies on the universities for the training and development of its staff. There is also no laid down system of industrial training for the teaching staff so that they can acquire industrial and practical experiences which they do not get sufficiently in the universities during their training programmes, but which they need, if they are to be effective and efficient trainers in the polytechnics. Employing academic staff of the right calibre is a serious problem confronting polytechnics. The problem is more exacerbated in polytechnics situated in rural areas where it is more difficult to attract highly skilled professional manpower so they rely on part-time lecturers from neighbouring urban institutions. Also, when the polytechnic sector is able to employ a qualified staff, this is short-lived as many moved over to the university because of better emoluments. The phenomenon of brain-drain from the polytechnics to the universities and elsewhere has become disturbing recently especially among staff trained up to Doctorate level: Kaduna Polytechnic for instance has 'lost' 6 PhD holders to universities within the last few years (Abubakar, 2020). The situation is the same in many other polytechnics as shown in table 3.

**Table 3. Academic Staff Distribution in Polytechnics by Qualification Academic staff - 2019**

Sector	HND		Bachelors		Masters		PhD			Total		
	M	F	M	F	M	F	M	F	MF	M	F	MF
Federal	1463	411	1639	416	2856	780	450	146	596	6408	1753	8161
State	1272	322	1825	421	3214	658	294	113	4076	6605	1514	8119
Private	383	94	436	103	948	165	78	14	92	1845	376	2221

**Source:** Digest of Education Statistics, 2019.

### **Weak Governance and Administration of Polytechnics**

The various Acts and laws establishing polytechnics as well as procedures are weak and do not adequately support the emergence of quality leadership. Appointments to governing councils of polytechnics are made to members of the community that do not have cognate experience on the management of such institutions. For instance, the year 2000 set of Governing Councils of Federal Polytechnics did not have a single former Rector, Registrar, Bursar or Librarian as Chairman or even a member for that matter on the Councils. Similarly, the Polytechnic Act does not adequately support effective committee system of management (Abubakar, 2020).

### **Insufficient Exposure to Work-place Training**

A good number of polytechnic students seeking to participate in the student's industrial work experience scheme (SIWES) are denied placement owing to insufficient openings and for fear of damage to their expensive equipment and when placed, they are not often allowed to carry out the practical work that they need. More often than not there is no commitment on the part of the industries to make students benefit by providing adequate supervision at shop floor level.

### **Recommendations and Conclusion**

#### **Access to Technical and Vocational Education**

For any meaningful expansion of enrolment in the Polytechnics and technical colleges; the challenges of obsolescence and decay of training facilities without replacement which largely hinders access to TVTE must be addressed. It is also recommended that institutions with long experience in running HND Programmes can easily introduce the Bachelors of Technology (B. Tech.) in those programmes. This will not only reduce pressure on the universities but will also raise the quality of instructions at the ND level. Furthermore, this will help

to improve the human capacity needed to move the economy towards the attainment of national development objectives and sustainable development. In order to address the problem of access to vocational education it is necessary to articulate alternative routes, which will be sufficiently attractive to the youths, enable skills acquisition and yet provide vertical and horizontal articulation with higher education (HE). Many countries have achieved this through engagement of the private sector in provision of training as well as designing a system which is sector-specific skills and competency-based, and very flexible to cater for the formal, non-formal as well as the informal sectors. Although these are being addressed by Government currently through the introduction of NVQF to regulate non-formal and in-formal vocational skills sector: establishment of Vocational Enterprise Institutions (VEIs) and Innovation Enterprise Institutions (IEIs) by the private sector, expansion of training facilities in polytechnics to boost enrolment in Science, Technology and Engineering programmes, embarking on campaign to encourage increased enrolment of girls and women in engineering, science & technology programmes.

### **Upgrading and Development of Infrastructures, Buildings and Equipment**

To address the problems of inadequate and obsolete physical infrastructural facilities and equipment in the Federal Polytechnics, there is need to embark on massive rehabilitation and upgrade programme of facilities for at least 5 years. There will be need for sustained financial commitments aimed at properly aligning and sustaining the Polytechnic system on the path that will ensure its ability to provide the level of technological training and manpower required for the attainment of the country's development goals. With an estimated unit cost of N600,000.00 per student per year, against an average receipt (grant, IGR and interventions) of N125,000.00, there is need for substantial improvement in general funding to Federal Polytechnics. Policy reform opportunities to provide additional funding should be considered (NBTE 2017).

### **Removal of all Forms of Barriers to the Progression of TVE Graduates**

Concerted effort by all stakeholders and government to implement Government policy that aims to remove all barriers against TVE staff and graduate is necessary in order to enhance technological growth and development, especially since TVET graduates have excelled to show exemplary competence in some fields. Engineering, for example is one area where the polytechnic graduates have excelled considerably especially among the

industry-based organized private sector operators. This point was corroborated by a statement credited to Engr. A.O. Faluyi. (One time President of COREN) where he stated that many employers claim that they find those now being registered as technologist as more useful to them than the registered engineers (As quoted in Abubakar, 2020). There is total unanimity in the education sector that polytechnics should be empowered to award their own degrees. This will have the desired effect of increasing enrolment in the polytechnics boosting in particular, enrolment into National Diploma (ND) programmes, and enhance the attainment of increased access to degree level qualifications.

### **Curricula Review**

As stated, earlier TVET curricular is overdue for review and updating TVET curricula must be aligned with national priorities and sustainable development agenda. Expansion and enriching of the curricula should make them more relevant to the requirements of industry and facilitate employment. This should take cognizance of latest technological development including automation of machinery/processes. The introduction of entrepreneurship education and incorporation of ICT is also important.

### **Human Capital Development**

There is need for high level capacity building for teaching and support staff to meet the global challenge for higher competence and communication, and other life skills. It is necessary to improve the quality and quantity of polytechnic staff through training and special staff development programme, along the line of UNESCO-Nigeria Project Staff Development Centers. Re-skilling and up-skilling of staff to improve their competence is a major imperative in polytechnic and technical education sector. An intensive staff development project should be embarked upon to ensure that academic staff acquire the relevant post graduate qualifications. More qualified lecturers should be employed to address shortages in some polytechnics. Similarly, efforts should be made to improve the competence and effectiveness of existing staff by encouraging and sponsoring them to attend relevant courses, workshops, etc., to enable them keep abreast of current developments in their field and professions. Teaching in the polytechnics should be made attractive to encourage qualified and experienced persons enter and remain in the system by the provision of attractive incentives to enhance their status and also give them a sense of job satisfaction. All forms of disparities in remuneration between staff in the polytechnics and their

counterparts in the universities should be removed. This applies particularly to salary level barriers.

### **Institutional and Industrial Linkages**

Institutional linkages with, especially, overseas higher institutions of high repute should strongly be encouraged and supported. This will, in addition to other benefits, assist staff that do not have postgraduate degrees to acquire them from the strong linkage program. The institutional linkage system should be supported with funds centrally budgeted by the Federal Government. The Polytechnics should be encouraged to seize the opportunity given by the World Bank Development project for Science and Technology Post-Basic i.e STEP B Project and ensure that they access funds for Staff Development. Staff teaching in areas such as Printing Technology, Catering and Hotel Management and Tourism where no post graduate programmes are available in any of the Nigerian Universities should be sponsored for studies abroad. Out of a total of over 3,300 full time academic staff in the Federal Polytechnics with only Bachelors HND, at least 30% of this should be supported to acquire higher degrees within three years. That is a total of 1,200 teaching staff to be trained over 3 years or 400 each year. This special staff development programme should be maintained for a period of at least five years.

The need to bring convergence between work and education in our formal education system has become imperative. Industrial linkages should be further strengthened by making it mandatory for the Polytechnics to enter into MOUs with relevant industries for the programmes they run. The industry should also be encouraged through tax reliefs to support the programme. In addition, academic staff of the Polytechnics should also be given the opportunity to acquire relevant industrial experience by attending short-term industrial attachments. There is need to establish a programme of industrial attachment for the lecturers, particularly in industries that have high consumption of their products in the country. This is with a view to have general knowledge of their operational processes and be able to produce ready to market graduates. However, the attachment should be able to include international industries as many of the products in the Nigerian market are imported. International industrial training exposure will further strengthen the capacity of the lecturers in our Polytechnics to deliver effective training for the global economy. This could be through bilateral agreements with the companies or other funding agencies, Monitoring of Outcomes. The attainment of sustainable TVET



requires systemic monitoring of outcome. This will involve monitoring the programmes, outputs generated and impacts. Some of the indicators for the monitoring and evaluation may include; the proportion of courses in which social, economic and environmental sustainability are integrated, the proportion of graduates who have taken such courses and the number of new courses addressing competencies for emerging sustainable industries.

### **Conclusion**

The objectives of the paper were to examine the role of TVE in sustainable development, self-reliance; and poverty reduction; examine the constraints to TVET in the country; and make recommendations that will enhance the achievement of the goals of TVET in Nigeria. In order to improve the delivery of quality technical and vocational education in Nigeria, there is need for the effective mobilization and efficient utilization, of resources for this purpose. This should include public mobilization involving the various levels of government and traditional institutions, religious and community leaders, voluntary agencies, NGOs, politicians, technocrats, students, staff and interested individuals, industry and the organized private sector. The collaborative efforts should aim at supporting TVET and arousing students' parents' interest in science and technology courses which could later result in increased enrolment into these programmes in the polytechnics as well as the newly established VEIs and IEIs.

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CHAPTER 5

# THE EFFECTS OF AFRICA'S INFRASTRUCTURE CRISIS AND ITS ROOT CAUSES

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## Abstract

*The development and expansion of any continent's economy are mostly dependent on the availability of world-class infrastructure capable of attracting international investors. The development and expansion of Africa's infrastructure is imperative; hence this will improve the African economy. The development and expansion of infrastructure improve the economy, resulting in many economic prospects for the inhabitants of any continent. However, in Africa, infrastructure development, investment, and preservation are among the lowest in the world. Infrastructure development will not only attract foreign investment and business, but it will also enhance trade between countries within the region. Trade between countries within the region is also heavily impacted by poor infrastructure investment in the continent, this puts much limits on economic prospects within the region. This is a major concern; thus, Africa has several deficiencies in transport, telecommunications, water, health, and education infrastructures, all of which are crucial for Africa's development. This is one of the main reasons why Africa has the highest levels of unemployment, poverty, food insecurity, migration, and poor education and healthcare systems. The author contends that investments and development in the African regional infrastructure are relatively low. This is a major*

*barrier to regional economic development since the development of the region's economy relies on the development of infrastructure. This is unfortunate; hence, the region's economy already lacks the capabilities to provide the people with economic opportunities. A qualitative method was used to investigate what is preventing infrastructure development in Africa and what this means for Africa as a developing continent.*

**Keywords:** *Africa, Development, Economy, Government, Infrastructure, Investment.*

## **Introduction**

The foundation of development is infrastructure. Adequate infrastructure is a crucial component of a setting that encourages investment and provides a living, and it fosters economic development, reduces poverty, and improves the provision of health and other services (Mitullah et al., 2016). Africa's economic progress is hampered by a lack of infrastructure development. The lack of infrastructure in Africa is an indication of unrealized productive potential and a great investment opportunity. If there is an unmet need for infrastructure, it remains a major barrier to conducting business in most African nations, reducing company productivity by around 40% (Chakamera & Alagidede, 2018). According to Mahmoud et al., 2022 infrastructure development is critical to encouraging growth and alleviating poverty. However, in Africa, inadequate infrastructure remains a stumbling block to long-term growth. Developing Africa's transport, electricity, water, and telecommunications infrastructure will be vital for governments to achieve long-term economic growth. Africa's infrastructure projects are severely underfunded, and nothing has been done lately to close the massive financial gap. Furthermore, infrastructure is critical for development. Dethier (2015) alluded to that many African nations are impoverished and unable to organize resources to improve infrastructure. When resources are mobilized, they are often spent very inefficiently. Many governments, confronted with conflicting priorities or challenging budgetary conditions, simply do not or cannot invest the resources required to achieve desired levels of access or quality. According to Jerome (2011), Africa's infrastructure is still far behind worldwide norms in terms of quantity and quality, despite the perception that efficient infrastructure is a crucial

component for economic progress, the elimination of poverty, and the achievement of the Millennium Development Goals (MDGs). Azolibe & Okonkwo (2020) concurred that adequate and effective infrastructure not only enhances people's quality of life but also encourages fast industrialization. The building of infrastructure in Africa is essential for promoting economic growth and improving the quality of life of Africans. It makes a substantial contribution to human progress, eradicating poverty, and achieving the Sustainable Development Goals. Abuka (2005) indicated that a crucial part of the investment climate is the infrastructure. One of the main obstacles to economic progress in Africa is the poor state of its transportation infrastructure, including its roads, rails, ports, airports, and electricity and telecommunications systems. Luiz concurs (2010) Productive governmental spending on infrastructure (such as roads, transit, and housing) and human capital may play an essential role in driving economic development and stimulating private investment. The lack of a suitable supporting infrastructure in Africa, such as telecommunications, transportation, and power supply, discourages international investment by increasing transaction costs. Furthermore, bad infrastructure diminishes investment productivity, deterring inflows (Dupasquier & Osakwe, 2006). Chakamera (2021) agreed that in Africa, poor and inadequate infrastructure consistently stifles productivity and economic progress. The present lack and bad (or deteriorating) infrastructures are the primary causes of the weakened and, in some cases, negative repercussions. The effect of inadequate infrastructure development in Africa as a developing continent is the study problem that this article seeks to analyze. Considering that the African continent is riven with various difficulties that may be solved via infrastructure development and investment. Most people in Africa earn their living selling goods on the streets of the continent. It is noteworthy that women are leading this type of trade within African states, and the lack of reliable roads and railways makes it difficult and harsh for women to trade. Poor infrastructure development is a major barrier to trade between countries within the region.

## **Methods**

This study investigates the issues of inadequate infrastructure development and investment and how it affects Africa's growth using the qualitative research approach. To answer the study problem and the purpose of this work, secondary sources that directly addressed the problems of infrastructure limitations in Africa were analyzed. The arguments among different stakeholders and the

theoretical literature that underpins this phenomenon are critically examined in the article. Research databases including Sabinet, Emerald Insight Journals, Google Scholar, IBSS, Scopus, and Science Direct were used to find pertinent material that addressed the main concerns of the paper. The information collected was interpreted using a thematic analysis. By using this research strategy, the authors were able to consider regional and international discussions on inadequate infrastructure investment and development in the African region. According to the article, infrastructure development in Africa is alarmingly lacking. As a result, effective development and investments in infrastructure would aid African states in resolving many of the problems the continent is currently facing, including poverty, unemployment, hunger, deficient healthcare systems, political instability, and a lack of adequate housing, to name just a few. If African governments develop and invest in infrastructure, all of Africa's existing problems can be addressed.

### **Result and Discussion**

**The Causes of Poor Infrastructure Development and Investment in Africa.** Lack of Funding to Prioritise Infrastructure Development in Africa. According to Deloitte (2021), funding is a serious concern for African infrastructure development. African governments have typically funded a significant portion of the continent's infrastructure development on a balance sheet basis, limiting infrastructure deployment to financial constraints. Additionally, local banks are often unable to provide the long-term financing required for infrastructure construction. To address the infrastructure backlogs of the continent, some type of partnership with private sector entities is an essential prerequisite. According to the Africa Development Bank (2018), a lack of funds for project planning in Africa is a limiting issue in infrastructure development. In general, if private entrepreneurs are not compensated when projects do not reach financial completion, which is rather common, the planning stage may be quite perilous. According to the Development Bank of Southern Africa (2019), infrastructure development on the African continent requires between \$130 billion and \$170 billion each year; however, financing falls short by \$68 billion to \$108 billion per year. According to Mahmoud et al., 2022, closing Africa's financial gap via investments in productive infrastructure will have national and global implications. In response to Africa's systemic shortage of finance for infrastructure projects, nothing has been done to close the massive financial gap. Due to current budget deficits and limited access to

foreign financial markets, new financing sources must be considered. According to Barka et al. (2018), the absence of large-scale investment is due to the limited engagement of private sector participants and the difficulty in mobilizing long-term funding from African financial institutions to finance large-ticket goods such as infrastructure. To address Africa's low degree of structural change, significant infrastructure investment via novel finance sources is required. Indeed, the New Partnership for Africa's Development Program for Infrastructure Development in Africa projects that Africa would need up to \$93 billion in yearly capital and maintenance investments. However, only \$60 billion can be satisfied with domestic resources and help from development finance institutions and other development partners.

**Weaknesses in infrastructure planning and project preparation.**

Khumalo, Choga, & Munapo (2017) alluded that for government agencies to save money, proper infrastructure planning together with efficient monitoring and assessment are crucial. In Africa, infrastructure development is often hampered by poor planning, low operational capacity, corruption, insufficient maintenance, and harmful environmental impacts (Van der Walddt, 2014). Despite an increase in foreign investment appetite and financing for infrastructure on the continent, the bulk of projects anticipated never reach financial closure, with a projected 80% of infrastructure projects failing at the feasibility/business plan stage (Abiru, 2021). Many African governments lack well-defined infrastructure programs and bankable project pipelines. Given costs, hazards, and long-time horizons, the private sector is not prepared to examine, plan, and prepare infrastructure projects. This implies that governments, donors, and international financial institutions (IFIs) must design long-term infrastructure based on population growth and development goals and the economic relevance of different regions (Africa Development Bank, 2018). Lakmeharan et al., 2020 mentioned a limited deal pipeline or selection of low-impact initiatives, often because of a lack of a long-term master plan capable of bridging political cycles. A shorter-term emphasis may result in a reluctance to construct bigger, more influential initiatives, as well as weak infrastructure policy frameworks leading to poor infrastructure project prioritization. Leigland and Roberts (2007) indicated that the project planning process has proven to be more difficult to accomplish than anticipated in the development of many major infrastructure projects in Africa; this is a prevalent problem among the world's poorest nations. Many African facilities have been

established to work on somewhat advanced projects, such as conducting feasibility studies to prove bankability and then carrying out the project to completion. According to Herrera et al., 2020, "inadequate project planning" is the most frequently cited challenge facing African infrastructure projects. Poor work scheduling, inadequate planning for materials supply, a lack of plans for acquiring machinery, inaccurate projections of goals and deliverables, sloppy hiring practices, insufficient traffic management plans, and inadequate environmental protection strategies are examples of planning processes that contribute to this problem. Shortcomings that need ad hoc solutions during construction, add expenditures to the project that were not accounted for at the beginning.

#### **Lack of bankable projects in Africa.**

Lay (2017) alluded that the absence of bankable projects in Africa is a cause for concern. A bankable project or proposal has enough collateral, future cash flow, a high likelihood of success, and is acceptable to institutional lenders. The bundling of smaller projects offers little hope for many African economies, since many of them may turn out to be unbankable due to their modest size (and highly risky). In Africa, the problem of inadequately planned or bankable projects is much more severe (Möykkynen & Pantelias, 2021). Lakmeeharan et al., 2020 mentioned that many governments and developers in Africa lack the ability and funds to plan and construct commercially viable infrastructure projects. Furthermore, short political cycles can put long-term infrastructure investments at risk. Therefore, investors have a shortage of bankable project pipelines: just a few projects match investors' risk-return expectations and achieve financial closure. Indeed, obtaining financial closure may be exceedingly difficult, even for projects in asset classes that have historically generated strong returns (such as power production) and for projects with assured revenues and guarantees. According to Abiru (2021), Africa's ongoing infrastructure deficit is caused by a shortage of bankable projects to invest in, which is attributable to a variety of issues. While there are several reasons why a project may not be bankable, the aspects of a bankable project can be classified as follows.

- i. **Legal and Regulatory Environment:** Given that project financing is typically a lengthy process, investors and project sponsors will typically need a certain amount of transparency and predictability in the legal and governmental framework of the country where the project is to be funded.



- ii. **Project Specificity:** The project preparation stage is one of the areas where most African infrastructure project plans fail. In this regard, sponsors and investors will need credible feasibility studies, in-depth technical studies, engineering designs, a business plan, a financial model, market studies, environmental & social impact assessments, as well as the required licenses and permits to build and operate the project.
- iii. **Project Financial Structure:** Given the enormous amount of money necessary to create infrastructure projects, the method through which project funding will be generated and repaid is an important bankability factor.
- iv. **Risk distribution:** Given the risks associated with project financing, it is crucial to distribute project risks to those who can best handle them. This is known as risk allocation.
- v. **Political & Economic Environment:** For project investors, the political and economic sustainability of a project is crucial, especially concerning currency risk, nationalization, taxes, changes in administration, government guarantees, etc.

**Corruption as an Impediment to Infrastructure Development in Africa:**

Corruption in Africa is a development concern. African nations cannot endure the expenses of corruption, which impedes growth and limits governments' capacity to eradicate poverty (Lawal, 2007). According to Adindu et al. 2019, corruption is a serious issue that wreaks havoc on many construction and infrastructure development projects in Africa and throughout the globe. This social hazard has infiltrated the construction sector in Africa and is presently hurting the quality of project performance badly. Corruption retards a country's growth because those in positions of power often utilize their positions for personal gain and wealth accumulation rather than a call to service. In Africa, corruption impacts investments, drives up and skews spending on necessities like infrastructure, education, and healthcare, as well as lowers the productivity of public investment and infrastructure via inappropriate use of talent and other resources. Additionally, it jeopardizes democratic principles, competitiveness, and a nation's economic foundation (Lumumba, 2011). African continent Corruption has a negative influence on the impact of infrastructure on productivity and development, emphasizing the significance of independent regulatory authorities in mitigating some of the effects of corruption on infrastructure services. Corruption increases the capital cost of infrastructure

projects, lessens their effect on productivity and growth, boosts recurring expenses, and affects the quality of infrastructure services (Ajakaiye, & Ncube, 2010). Likely, nations with worse infrastructure would often have higher levels of corruption (Gillanders, 2014). Kenny (2007) alluded that the effect of corruption extends beyond bribe payments to poor-quality infrastructure buildings with low economic returns and inadequate money for upkeep - and here is where most of the harm is seen. Because building plays such an important part in growth, corruption in the industry may be exceptionally damaging. The corruption that leads to low-quality construction or that fosters an atmosphere of bad project selection and inadequate maintenance may drastically diminish the economic return on investment. Corruption, maladministration, and a lack of accountability have all had a detrimental influence on Africa's growth. Corruption suffocates progress and raises the cost of procedures, particularly in areas where infrastructure development is needed, such as Africa (Chiweshe, 2014). Corruption may also impair public infrastructure owing to misallocation issues and tax revenue loss. The causation runs from corruption to infrastructure, and there is a negative association between corrupt conduct and tax collections. Corruption may result in decreased social expenditures in this aspect (Koyuncu & Ünver, 2017). Corruption is another factor of poor and inefficient infrastructure development in Africa. Infrastructure development actors are particularly vulnerable to corruption threats, owing to inadequate governance and a lack of openness and accountability. Corruption also leads to superfluous initiatives, higher public expenditure, low competitiveness, fewer budgets for infrastructure upkeep, and poor quality. It also undermines institutional capacity and effectiveness, resulting in a decline in public faith in governments (Organisation for Economic Co-operation and Development, 2018).

**Poor Infrastructure Management in Africa:** Infrastructure is one of Africa's most essential economic drivers, allowing industry to create and governments to provide services sustainably. To achieve sustainability, infrastructure conditions must be maintained in such a way that goods and services may be supplied successfully and efficiently (Nhleko & Inambao, 2019). Infrastructure is critical to any country's social and economic growth (Foster, 2010). Infrastructure maintenance and growth are crucial aspects of sustaining economic activity in a rising economy (Perkins, Fedderke & Luiz, 2005). If Africa wants to achieve any type of economic progress, it must have a well-functioning infrastructure. Working infrastructure creates economic opportunity, works as

a catalyst for economic progress, and eventually allows much-needed job creation (Creamer Media, 2020). One of the main issues in Africa is the lack of physical infrastructure. Furthermore, the lack of maintenance, administration, and repair has accelerated the deterioration of existing physical infrastructure (Arewa, 2016). The infrastructure of Africa seems to be rapidly degrading, due to a lack of regular maintenance, skill shortages, and misuse. While overuse is the result of fast economic expansion mixed with a relatively little increase in infrastructure quantity, maintenance, and skill shortages are the result of bad planning, finance, and education and training policies (Fourie, 2008). Major investments will still be necessary to repair Africa's aged and failing infrastructure, bring it into compliance with increasingly severe environmental and health laws, and sustain service quality in the future (Hukka & Katko, 2015). The asset value of the road network exceeds 30% of the gross domestic product (GDP) in numerous countries, indicating the scale of the maintenance challenge. In general, road conditions lag behind those seen in other emerging areas, even though the network of important trunk roads has been kept in reasonable shape (Gwilliam, 2008). Rural roads in Africa have substantial problems due to the lack of money and engineering involvement during both building and maintenance operations. For these reasons, rural roads are often in poor shape and, during the rainy season, become practically inaccessible due to erosion processes that severely harm them. The poor quality of rural roads has serious implications for the economic transit of products and services, as well as the general mobility of people, impeding the country's growth (Ngezahayo, Burrow, & Ghataora, 2019). For example, inadequate and inadequate infrastructure and buildings might be directly connected to Africa's poor road network. Several African governments have focused on modernization and rebuilding towns into standard interconnected metropolises throughout the years, which has tremendously affected Africa (Arewa, 2016). The lack of scheduled maintenance for certain infrastructure in African nations has resulted in it degrading to the point that it was too costly to maintain and repair, yet the only long-term answer was a replacement (Lorraine & Rimuka, 2022).

**Consequences of inadequate infrastructure development in Africa:** In terms of infrastructure,

Africa is the least developed continent in the world. It also lacks in terms of the quality of infrastructure services provided to consumers. The infrastructure is sparse, and its performance is typically subpar: It is expensive, irregular, and unreliable (Bond, 2016). Unfortunately, infrastructure failures in Africa are

significant drivers of community instability, pollution, the accumulation of expensive energy and financial bills, and the increasing need for capital infusions (Nhleko & Inambao, 2019). The lack of infrastructure is a major impediment to broad-based economic progress in Africa. Generating capacity, electrical demand, and supply security are all insufficient (Oluwatayo & Ojo, 2018). Inadequate social infrastructure in Africa has become a barrier to economic development and the fight against poverty (Reddy, 2016). Africa's infrastructure stock is depleted, especially in the electricity sector. More than 640 million Africans lack access to energy, giving African nations an electricity availability percentage of just over 40%, the lowest in the world. Access to energy is critical not only for achieving health and education results but also for lowering corporate costs and unleashing economic potential, therefore generating employment (Africa Development Bank, 2018). Africa's total infrastructure investment needs are projected to be US\$93 billion per year, with the energy sector having the largest infrastructure gap, whether evaluated in terms of energy demand, generating capacity, or supply security. Most African nations are suffering from severe "energy poverty," with limited access, particularly in rural areas, poor purchasing power, low energy efficiency, and an overreliance on traditional biomass to meet basic energy demands (United Nations, 2020). Most African rural areas have insufficient and unreliable infrastructure services. Households in rural areas lack access to clean drinking water, power, reliable transportation, and modern communication services. Only 34% of rural Africans live within two kilometers of an all-season road, compared to 66% of people in other developing countries (Africa Monitor, 2017). Poor infrastructure continues to stifle African economic progress. Even though foreign investors have adequate interest and cash to support African infrastructure projects, 80 percent of infrastructure projects fail during the feasibility and business planning stages (Holtz & Heitzig, 2021). According to Lakner et al. 2018, Africa is trapped in a poverty trap, where poverty is so severe that it is impossible to alleviate debilitating issues such as hunger, sickness, and a lack of infrastructure. These problems, in turn, stifle economic progress and contribute to rural depopulation. This fact cannot be overstated: Africa is plagued by a lack of infrastructure amenities. For a long time, there have been many discussions on Africa's lack of adequate basic infrastructure, such as favourable residential living spaces for its citizens, elegant office buildings, tasteful retail malls, acceptable airports, decent road networks, and reliable electricity grids (Akinshipe and Aigbavboa, 2020).

**What initiatives can Africa employ to enhance infrastructure development within the continent? Attraction of Funding to Prioritise Infrastructure Development in Africa:**

According to Kirkpatrick et al. (2004), countries with bigger infrastructure requirements will be more appealing to foreign infrastructure investment. Economic policy, economic structure, promoting, supporting, and political variables are all elements that attract foreign investment. Foreign investors tend to invest more directly in countries with a stronger economic structure and infrastructure. Market extent, infrastructure installations, expert labourers, human resource development, and a wide information network are among the primary structural characteristics of an economy that directly impact foreign investment attractiveness (Barzelaghi, 2012). According to McDonald and Bailly (2017), the most valuable characteristics of an investable place for investors are:

- i. A strong economy with growth potential, a highly skilled workforce, and resilience to economic downturns and external shocks; and
- ii. Excellent transport connections, both within and beyond the city (nationally and internationally), as well as a transport system capable of keeping up with an expanding economy.

To attract investors, the regional government must develop rules to stimulate economic growth. Furthermore, the government system must be modified to be more effective and efficient, such as by eliminating lengthy procedures (Murwito et al., 2013). Facilities and infrastructure, particularly the provision of energy, water, and transportation, must be well prepared. If energy and water supplies are unpredictable or transportation costs are extremely high, investors will be particularly concerned (Windhyastiti et al., 2019). Poor transport infrastructure in developing nations is a significant barrier to attracting foreign direct investment. Reduced production costs through facility expansion and improved technological level are two ways to increase the flow of foreign direct investment into a country (Barzelaghi, 2012). Strong infrastructure reduces transit costs, creating an incentive for regional and global enterprises to enter, and attracting foreign investment. Weak infrastructure raises business expenses and reduces foreign investment. Inappropriate transportation or the usage of faulty equipment due to communication problems signifies a loss of loyalty for businesses. As a result of the high transportation expenses, they will not choose that place for business. As a result, the infrastructure should create a favorable investment environment for international companies (Van der Waldt, 2014).

According to the findings of Khadaroo and Seetanah's (2010) study, transport capital has been a significant component in making the country appealing to foreign direct investors in both the short and long run. In general, infrastructure development should become an important element of the overall strategy to attract FDI inflows. Instead of competing with industrialized nations by giving investment incentives, developing countries are advised to focus on physical infrastructure development in their own countries. This would serve to mobilize domestic and international investments, which would aid in the growth of these countries. However, from a political point of view, the building of new facilities is more appealing than maintenance (Bisbey, 2020).

**Infrastructure planning and project preparation enhancement:** Taxpayer money should be used wisely, but infrastructure projects should also be more appealing to private investors. As a result, improving government efficiency should be regarded as a requirement for nations seeking to increase their access to infrastructure funding (Yescombe and Farquharson, 2018). A life cycle strategy is essential to improve the efficiency of infrastructure projects. While most people think of cost overruns during the building stage, expenses during the planning, preparation, and procurement stages, as well as the administration and maintenance of infrastructure assets after completion, may all skyrocket. (Bisbey, 2020). Improving public governance has the potential to close nearly two-thirds of the infrastructure efficiency gap. To integrate fragmented sectoral plans and build national frameworks in which public investment choices are made transparently and effectively, changes in both sectoral and national governance are necessary. Transparency is required for this to be realised. Countries should develop transparent systems for identifying needs, selecting projects, and planning to combat corruption. Several strategies, tools, and best practices have been created to help governments combat corruption and provide better public services in areas such as education, water, health, and the judiciary (Schütte et al., 2016). Avoid arbitrary project selection by developing a comprehensive infrastructure master plan based on established public requirements over a sufficiently extended period. This would include systematically comparing long-term demands with long-term planning to identify which form of infrastructure would be optimal. Instead of developing a new physical asset, there may be economies in improving soft infrastructure, such as regulatory compliance. To ensure effective allocation of financial resources across all sectors, it is advisable to construct a portfolio strategy over a



variety of sectors rather than a single sector (Abiad et al., 2017). To develop an economically feasible pipeline, emphasising quality over quantity will improve efficiency. Ministries are under pressure to provide a large wish list, which is sometimes misinterpreted as the real project pipeline. This "wish list" of projects, which is the result of fragmented and unsystematic project selection procedures, frequently lacks fundamental costing, requirement analysis, and income forecasting information. In a climate of limited public resources, most of these expenditures result in partial or no results (Bisbey, 2020). Long-term budgeting is required for long-term planning. However, most nations allocate budgets on a one- to three-year basis within a medium-term framework. While capital expenditures are passed from the central budget to sectoral ministries, operating and maintenance costs are considered expenses under local public budgeting. This is often the rationale for the division of government subsidies into two distinct streams: one for capital grants and the other for operations. This leads to a loss of optimisation in the project's use of public funds (Bisbey, 2020).

**Attraction of bankable projects in Africa:** Africa's infrastructure finance needs are significant, but implementation ability is inadequate. Access to infrastructure funding is limited by a lack of bankable projects and a lack of well-developed project and programme plans (Ntsimane, 2017). Increased bankability of African infrastructure projects will be achieved by significantly increased funding of early-stage project development activities enabled by new partnerships and incentive programmes. Africa will make qualified legal, technical, and financial professionals accessible to projects from the start, sharing expenses with member countries and developers and recovering its funds at the project's financial closure or through a carried interest (Kaberuka, 2014). Governments and their institutional partners may take decisive action to increase project commercial viability, including assisting in the mitigation of political, currency, and regulatory risks, as well as enhancing the deal flow of bankable projects (Lakmeeharan et al., 2020). National governments should encourage and galvanise finance for a bankable infrastructure pipeline. Increased supply of 'technical grant-based funding' by donor countries, DFIs, and national ministries of finance to advance projects from feasibility to bankability would aid in unlocking private sector participation. Attracting impact investors will also aid in increasing investment in climate financing initiatives (Rumble & First 2021). Direct finance of project design, planning, and

implementation, as well as technical assistance to support these activities, can help develop more bankable projects, attracting private investors and boosting local economies (Ashiagbor et al, 2018). According to Kennedy et al. (2012), developing country governments may stimulate private investment in low-carbon infrastructure development by giving projects with appealing risk-return profiles, i.e., bankable projects. Additional study backs up the idea that a high return-risk profile is required for obtaining private investment because private funders only deem a project appealing if it has the potential to generate profits.

**Rooting out corruption in infrastructure development in Africa:**

Corruption is seen to have a greater negative impact on investment choices in Africa than in Asia. After considering other factors such as infrastructure availability (Talvitie, 2017). African nations should enhance their monitoring structures and anticorruption activities so that corruption can be tracked and traced. Furthermore, institutional capacities must be strengthened to fill any gaps in public resource management, tax administration, and foreign trade. The discovery that foreign debt undermines corruption control should raise red lights about how earnings are used in the economy. Most of the debt is used for infrastructure development or discretionary government spending, both of which are notorious conduits for corrupt deals (Zulu, 2018). Corruption has resulted in physical, social, and human deterioration and dereliction within the infrastructure of government and society. The African government must implement transparency devices, technological know-how, and electronic tactics to identify and prevent corruption in all sectors. The introduction of cameras in public locations, as well as computerised voting systems, will help in this regard. Prevention is preferable to treatment (Bakare, 2011). If African governments are serious about weeding out public corruption, punishments against individuals who break public trust should be reinforced rather than loosened (Awofeso & Odeyemi, 2014).

**Conclusion**

Infrastructure is crucial for economic growth and poverty alleviation. Good infrastructure facilitates the movement of goods, services, information, and people. Improving Africa's infrastructure is a necessary but insufficient condition for stimulating economic development and attracting investment to the continent. Because the African infrastructure is so interwoven, regional



coordination in infrastructure delivery is crucial. Africa still has a long way to go in terms of developing infrastructure in both urban and rural regions, which is critical to helping Africa overcome its problems. African governments must prioritize infrastructure planning and project preparation since it is a key hindrance to the success of African projects. African governments must develop systems to eliminate corruption during project execution. Finally, African countries must invest in bankable projects to attract investors and prioritize the maintenance of existing infrastructure on the continent.

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CHAPTER 6

# FINANCIAL RISK MANAGEMENT STRATEGY

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## Abstract

**F**inancial risk management strategy has been a major discourse amongst scholars and financial experts. This is based on the contention that organisation can hardly succeed without embarking on risk. Some of the significance of financial risk management include the prevention of financial leakages, strengthening formal decision-making, financial Stability, promoting regulatory compliance, increasing stakeholder confidence, and promoting innovation as well as corporate sustainability. Financial risk management strategies are cash reserves, asset or liability management, contingency funding plans, funds source diversification, and access to central bank facilities. This paper concludes that financial risk management strategies offer a thorough overview of the different kinds of financial risks that businesses face quite apart from methods and resources available to implement and mitigate the risks.

**Keywords:** Financial risk management, Risk, Credit Risk Management

## **Introduction**

Risk is one of the basic categories in contemporary economic theory and practice (Ameniya, 2015). It has to do with the fact that the general characteristic that represents the uncertainty of economic events and processes can when realized, result in large losses rather than gains. The subject of uncertainty and risk is one of the primary focuses of contemporary microeconomic analysis due to its urgency and the necessity of rationalizing the actions of economic agents (Stroughair, 2019). Risk is assumed by economic entities that engage in entrepreneurial activity, such as households, businesses, governments, and enterprises. Their economic actions are carried out in an uncertain environment among actual social and economic processes, a range of potential states and circumstances surrounding the implementation of the solution, and the potential future appearance of the economic entity. Jorion (2019) argues that, since uncertainty is an inherent aspect of the environment, risk is, thus, objectively, a necessary component of any economic decision. It is not always feasible to have full and precise knowledge of all the internal and external variables that might or might not show up at the time of decision-making in a time-remote context for the implementation of a solution. Reliable attainment of the objectives of the enterprise financial activity is made possible by the effective management of the financial risks associated with the enterprise (Bangia, 2019). This is a key component of the overall system of financial management. Thakor (2018) argues that the primary goals of financial risk management are to guard against potential declines in the market value of the company and to guarantee its financial stability as it develops.

## **Financial Risk Management**

Financial risk management is the process of locating, evaluating, and reducing risks that can influence the economic performance of a business (Jorion, 2019). To control risk, a variety of techniques and instruments are used (McNeil et al., 2019). Risk management is a highly significant competency in business, human life, and company operations (Arnsdorf, 2012). A risky event could occur inside or outside and compromise goal achievement. Every risk is described in terms of likelihood and damage, and each has its sources and effects. An event that poses a risk to the company's objectives is called a risk. Because certain risks can be taken, some can be increased, and some can be avoided, the purpose of risk management should not be to reduce risks but rather to ensure that decisions are made with risks in mind (Jorion, 2019). The steps in the suggested risk

management process are to monitor risks and identify, assess, create, and put into action risk mitigation strategies.

### **Importance of Financial Risk Management**

Determining a company's financial requirements to meet its short- and long-term objectives is the focus of this branch of financial management. Shin (2010) suggests that Capital budgeting is a tool used by financial managers to assess if projects and/or investments are profitable and provide value to the company. According to McNeil et al. (2019), financial risk management is crucial for the reasons listed below:

- i. **Prevents Financial Losses:** By managing financial risks, companies can lessen their exposure to possible financial losses brought on by unfavorable changes in the market, credit defaults, liquidity issues, or operational blunders.
- ii. **Strengthens Decision Making:** Financial risk management offers insightful information that helps strengthen decision-making procedures by recognizing and measuring risks. It helps businesses to make well-informed decisions regarding finance, investing, and taking risks.
- iii. **Ensures Financial Stability:** A company's overall financial stability is influenced by effective risk management. Organizations may keep a solid financial position and stay out of financial difficulty by putting the right risk mitigation methods into place.
- iv. **Promotes Regulatory Compliance:** Financial risk management aids in an organization's adherence to norms and regulations. By ensuring that businesses adhere to legal and regulatory frameworks, it lowers the possibility of fines or other consequences.
- v. **Increases Stakeholder Confidence:** Organizations can gain the trust of their stakeholders by showcasing strong financial risk management procedures. It conveys to creditors, investors, and other interested parties that the company takes an active approach to risk management.
- vi. **Promotes Growth and Innovation:** Organizations can more confidently pursue growth opportunities and new projects when risks are managed well.

### **Historical Context and Evolution of Financial Risk Management**

"The modern concepts and practices emerged in the 20th century, but the historical context and evolution of financial risk management can be traced back to ancient times" (Berkowitz, 2011). Berkowitz (2019) accentuates that traders and merchants utilized a variety of strategies to safeguard their assets and commodities against risks including market volatility, natural disasters, and theft in ancient civilizations. This is where the idea of risk management originated. Modern financial markets and institutions emerged because of the Industrial Revolution in the 18th and 19th centuries. The necessity of risk management techniques became increasingly clear as trade and commerce expanded. The creation of fundamental risk management instruments like insurance and hedging occurred in the early 20th century. These instruments assisted companies in safeguarding themselves against hazards like fire, robbery, and natural calamities. The 1930s Great Depression brought attention to the need for more advanced risk management techniques. Risk management tactics were reassessed in the wake of the stock market meltdown and the demise of numerous financial organizations.

Arnsdorf (2012) states that contemporary financial risk management ideas and methods emerged in the years following World War II. As a result of the research and quantification of numerous risks by economists and financial specialists, risk management models and procedures were developed. Financial risk management made great strides in the 1970s and 80s with the introduction of ideas like Value at Risk (VaR) and the Black-Scholes-Merton option pricing model. These innovations established the framework for contemporary risk management techniques. "Technological and financial innovation drove further advancements in financial risk management starting in the 1990s" (Ameniya, 2015). The Basel Accords, which established global guidelines for banking regulation, had a big influence on how risk management is done today. With advanced tools and strategies used to control a variety of hazards, financial risk management is becoming a crucial component of the financial sector. The necessity for organizations and institutions to safeguard themselves against a variety of hazards and the growing complexity of the financial markets are reflected in the history of financial risk management.

### **Types of Financial Risks**

The following financial risks shall be discussed in this chapter

- i. Market risk,

- ii. Credit risk,
- iii. Liquidity risk, and
- iv. Operational risk

### **Market Risk Management**

Market risk as defined by Bangia and Stroughair (2019), is the possibility of suffering a financial loss as a result of fluctuations in market prices and other variables including interest rates, currency rates, and commodity prices. For investors, financial institutions, and companies that are subject to changes in the financial markets, it is a major worry.

### **Sources of Market Risk**

For risk management to be effective, it is essential to comprehend market risk and its sources. Consequently, the following sources of market risk were identified by Bangia and Stroughair (2019).

- i. **Equity Risk:** Investing in stocks or other equity instruments carries a certain amount of risk. It results from changes in stock prices brought on by variables like business performance, prevailing economic conditions, and market sentiment.
- ii. **Interest Rate Risk:** This refers to the possibility that shifts in interest rates will have an impact on the price of fixed-income instruments. For instance, bondholders experience capital losses when interest rates rise because their existing bonds lose value.
- iii. **Currency Risk:** Also referred to as exchange rate risk, currency risk is the possibility that shifts in international exchange rates will have an impact on the value of investments made in foreign currencies. Businesses and investors who conduct business or make investments abroad should be aware of this risk.
- iv. **Commodity Risk:** This refers to the danger that comes with making investments in goods like gold, oil, or agricultural products. Weather, geopolitical events, and the dynamics of supply and demand can all have an impact on commodity prices.
- v. **Volatility risk:** This refers to the risk arising from fluctuations in market pricing. Unpredictable price changes brought on by high volatility may put traders and investors at greater risk.
- vi. **Systematic Risk:** Also referred to as market risk, systematic risk is the risk that has an impact on the market as a whole or on a specific market sector. It is a part of the market and cannot be eliminated by

diversification. Natural catastrophes, political developments, and economic downturns are a few examples.

Developing successful risk management techniques requires an understanding of various sources of market risk. Investors and companies can lessen the impact of market swings on their portfolios and operations by implementing appropriate hedging and diversification strategies after recognizing and measuring their exposures to market risk.

### **Quantitative Methods for Measuring Market Risk and Hedging Strategies**

According to McNeil (2015) investors and financial institutions, risk management strategies heavily rely on quantitative techniques for assessing market risk. As per the findings of Alexander and Li (2014), Value at Risk (VaR) and Expected Shortfall (ES) are two often employed techniques.

#### **Value at Risk (VaR)**

According to Li (2014), Value at Risk is a statistical metric used to estimate the possible loss that an investment or portfolio of assets may experience at a particular confidence level and over a given time horizon. It estimates the greatest loss that could be anticipated from typical market moves using statistical models or historical data. Value at Risk (VaR) is a financial measure that is usually computed at a given confidence level (e.g., 95%, 99%) and for a given time horizon (e.g., one day, one week, and one month).

#### **Expected Shortfall (ES):**

Conditional Value at Risk (CVaR), another name for Expected Shortfall, is a risk metric that expresses the expected loss above the VaR threshold. In contrast to VaR, which estimates the maximum loss, ES estimates the average loss that would be sustained if losses surpass the VaR threshold. Because it accounts for the tail risk of the loss distribution, ES is regarded as a more conservative risk metric than VaR. Though they each have drawbacks, VaR and ES are useful instruments for assessing and controlling market risk, according to Alexander and Li (2014). For instance, VaR is based on historical data and makes the unavoidable assumption that market conditions in the future will resemble those in the past. Conversely, ES offers a more cautious estimate but necessitates more advanced modeling methods and data.

## **Credit Risk Management**

As stated by Thakor and Cai (2018). The possibility of suffering financial loss if a borrower defaults on a loan or fails to fulfill contractual obligations is known as credit risk. Since it may affect financial institutions' profitability, liquidity, and general stability, it is a major worry. An outline of credit risk and how it affects financial firms may be found here. According to Thakor (2018), credit risk is the possibility that a counterparty or borrower won't fulfill its responsibilities, which would cause the lender or investment to suffer a financial loss. It encompasses the risk of non-payment or late payment in addition to the risk of default, which is the inability to repay principal or interest.

### **Types of Credit Risk**

- i. Default risk: The possibility that a borrower won't fulfill their debt or loan obligations is known as default risk.
- ii. Concentration risk is the chance that a sizable percentage of a financial institution's loans are concentrated in the hands of a small number of borrowers or businesses, which makes defaults more significant.
- iii. Give credit Spread risk is the possibility that the interest rate differential between risk-free and other fixed-income assets will increase, which could have an impact on the securities.

### **Impact of Credit Risk on Financial Institutions:**

**Profitability:** Loan losses and higher bad debt provisioning are two ways that credit risk can affect a financial institution's profitability.

**Liquidity:** A financial organization may encounter difficulties meeting its short-term obligations if it has a high rate of loan defaults.

**Capital Adequacy:** According to regulations, financial institutions have to keep a specific amount of capital on hand to cover any losses from credit risk. Greater capital reserves may be required in cases of significant credit risk.

**Reputation:** A financial institution may suffer from a loss of trust among stakeholders, including investors and depositors, because of a high degree of credit risk.

### **Credit Scoring Models**

**Conventional Credit Scoring:** This approach evaluates borrowers' creditworthiness using statistical methods based on their credit history, income, work status, and amount of outstanding debt. It allots a credit score based on an estimation of default risk.

**Machine Learning-Based Scoring:** To estimate credit risk more precisely, these models employ sophisticated algorithms to examine a larger variety of data sources and characteristics. Non-traditional data, like spending trends, payment behavior, and social media activity, can be included.

#### **Credit Risk Assessment Techniques**

- i. **Credit analysis:** This is the process of determining a borrower's creditworthiness by examining financial records, credit reports, and other pertinent data. It evaluates elements including the ability to repay debt, stability of finances, and potential for growth.
- ii. **Cash Flow Analysis:** This method evaluates a borrower's capacity to produce enough cash flow to cover their debt payments. To ascertain repayment capacity, past and future cash flows are analyzed.
- iii. **Evaluation of Collateral:** Collateral reduces credit risk and is used to secure loans. This method entails evaluating the collateral's quality and value to ascertain if it will be sufficient to cover potential losses in the case of default.

#### **Credit Risk Mitigation Strategies**

- i. **Diversification:** Financial institutions can lessen the impact of credit risk by spreading their loan portfolios among various businesses, geographical areas, and borrower types.
- ii. **Financial products (credit derivatives):** These are used to shift credit risk from one party to another. Credit-linked notes and credit default swaps (CDS) are two examples.
- iii. **Securitization:** This is the process of combining loans or other debts and offering them to investors as securities. It assists in removing credit risk from the original institution.
- iv. **Credit Insurance:** To guard against losses from borrower defaults, financial institutions might get credit insurance. If there is a default, the insurance company pays the institution.

#### **Liquidity Risk Management**

Adrian and Shin (2010) define liquidity risk as the possibility that a financial organization or entity won't be able to pay its short-term debts when they're due without suffering intolerable losses. It can also be used to describe how hard it is to sell an item without significantly depreciating its worth.



### **Liquidity Risk Measurement and Monitoring Techniques**

- i. Liquidity Coverage Ratio (LCR): LCR is a regulatory criterion that assesses a financial institution's capacity to use high-quality liquid assets to satisfy its short-term commitments. It is computed as the 30-day net cash outflow ratio to high-quality liquid assets.
- ii. The second regulatory criterion is the Net Stable Funding Ratio (NSFR), which evaluates a financial institution's funding sources' stability concerning its assets and off-balance-sheet exposures over one year.
- iii. Stress Testing: To evaluate the impact on a financial institution's liquidity status, stress testing entails simulating several unfavorable scenarios. It facilitates the identification of potential weak points and enables backup plans.
- iv. Cash Flow Analysis: To make sure a financial institution has enough liquidity to fulfill its responsibilities, cash flow analysis entails tracking cash inflows and outflows. It aids in managing liquidity risk and finding liquidity gaps.
- v. Liquidity Risk measures: Liquidity risk is measured and tracked using a variety of measures, including the liquidity coverage ratio, net stable funding ratio, and other liquidity ratios. These measurements aid in determining whether a financial institution's liquidity position is adequate.

### **Liquidity Risk Management Strategies**

- i. Cash Reserves: One of the most important strategies for managing liquidity risk is keeping sufficient cash reserves. It guarantees that a financial organization possesses enough liquid assets to cover its immediate liabilities.
- ii. Asset/Liability Management (ALM): To make sure a financial organization has enough liquidity to satisfy its obligations, ALM entails managing the balance between its assets and liabilities. It involves tactics like matching the characteristics of assets and liabilities in terms of maturity and liquidity.
- iii. Contingency Funding Plan (CFP): A CFP is a document that describes how to obtain extra funding during difficult or turbulent financial circumstances. It contributes to a financial institution's ability to sustain liquidity in challenging conditions.
- iv. Funds Source Diversification: By lowering reliance on a single source of funds, diversification of funding sources lowers liquidity risk. To provide

finance flexibility, it entails gaining access to a variety of funding markets and tools.

- v. Access to Central Bank Facilities: When there is a shortage of liquidity, financial institutions can get emergency funding through central bank facilities including discount windows and liquidity facilities. When other sources of cash could be costly or unavailable, these facilities offer a source of liquidity.

Financial institutions must measure, monitor, and manage liquidity risk effectively to preserve liquidity and financial stability (Shin, 2010). By putting these methods and tactics into practice, financial institutions can reduce the risk of liquidity problems and remain able to fulfill their obligations even under difficult market conditions.

### **Operational Risk Management**

Operational risk in financial institutions is defined by Bekowitz (2011) as the risk of loss because of either external events or insufficient or unsuccessful internal procedures, people, and systems. It is one of the main hazards that financial institutions deal with and can originate from a variety of things, including fraud, technological malfunctions, human mistakes, and problems with legal and regulatory compliance. Financial organizations must comprehend operational risk to properly manage and reduce it.

### **Sources of Operational Risk**

According to Bekowitz (2011), operational risk might originate from the following sources.

- i. Internal Factors: These comprise flaws or omissions in systems, processes, or staff conduct; examples include incorrect data entry, improper transaction processing, and non-compliance with protocols.
- ii. External Factors: These are uncontrollable occurrences like terrorist attacks, natural catastrophes, or modifications to laws that influence how the institution conducts business.

### **Impact of Operational Risk**

Financial Losses: Errors, fraud, or interruptions in business operations can result in operational failures that cause financial losses.

- i. Reputational Damage: A financial institution's reputation may be harmed by operational mistakes, which could result in a decline in clientele and revenue.

- ii. Legal and Regulatory Repercussions: In the event of an operational failure, fines, penalties, and punishments may be imposed by law and regulation.
- iii. Business Disruption: Operational errors can cause a company's activities to be disrupted, which can result in lower profits and higher expenses.

### **Operational Risk Assessment**

According to Bekowitz (2011), "Operational risk assessment involves identifying, analyzing, and evaluating the potential risks to an organization's operations." Usually, this procedure entails the following steps:

- i. Risk Identification: Determine possible operational risk sources, such as people, systems, internal processes, and external variables.
- ii. Risk Analysis: Evaluate each identified risk's likelihood and possible consequences. Both qualitative and quantitative methodologies can be applied to this.
- iii. Risk Assessment: Using the analysis as a guide, determine the overall level of risk. Determine which risks need to be mitigated and which ones are acceptable.

### **Operational Risk Mitigation Strategies**

- i. Process Improvement: To lower the possibility of mistakes, breakdowns, and inefficiencies, continuously assess and enhance internal procedures.
- ii. Internal Controls: To reduce operational risks, put internal controls in place. This covers task segregation, frequent audits, and compliance oversight.
- iii. Training and Awareness: To help staff members comprehend operational hazards and how to reduce those, offer training and awareness initiatives.
- iv. Insurance: Purchase insurance policies that cover damages resulting from operational failures to transfer some operational risks to insurance providers.
- v. Outsourcing Risk Management: Make sure that risks related to outsourcing operations are correctly recognized, evaluated, and controlled using efficient vendor management procedures.

By using these tactics, financial institutions can reduce operational risks' possible influence on daily operations and handle them more skillfully.

### **Regulatory Framework for Risk Management**

According to Amemiya (2015), the purpose of regulatory requirements for financial risk management is to protect the stability and soundness of markets and financial institutions. He claims that the Dodd-Frank Act is one of the major regulatory frameworks that has significantly impacted financial risk management:

#### **Dodd-Frank Act:**

In reaction to the 2008 financial crisis, the Dodd-Frank Wall Street Reform and Consumer Protection Act was passed. It brought in a plethora of regulatory changes designed to enhance the financial system's responsibility, transparency, and stability. The Financial Stability Oversight Council (FSOC) was created by Dodd-Frank to detect and keep an eye on systemic hazards inside the financial system. To shield customers from dishonest financial practices, it also established the Consumer Financial Protection Bureau (CFPB). Dodd-Frank established several risk management-related measures, such as the Volcker Rule, stricter prudential rules for big financial institutions, and mandates for stress testing.

For institutions, a crucial component of financial risk management is regulatory compliance. Meeting these needs, however, presents a few difficulties, such as:

- i. **Complexity of Regulations:** It can be difficult for institutions to maintain compliance with financial regulations since they are frequently complicated and susceptible to frequent modifications.
- ii. **Interpretation and Implementation:** Since regulations are subject to multiple interpretations, it can be difficult to apply them uniformly across departments and roles.
- iii. **Cost of Compliance:** Since following regulations frequently necessitates investing in systems, procedures, and staff, compliance can be expensive.
- iv. **Resource Limitations:** It's possible that small and medium-sized organizations don't have the knowledge and resources necessary to meet the demands of intricate regulations.

- v. Globalization: Organizations that operate in several jurisdictions must deal with the difficulty of adhering to laws that differ between nations and areas.
- vi. Technology and Data Management: To properly gather, store, and report data, organizations must frequently have strong technology and data management processes in place.

Institutions can use the following tactics to deal with these issues and guarantee that regulations are followed:

- i. Sturdy Compliance Program: To guarantee compliance with regulations, create and implement a thorough compliance program that consists of rules, processes, and controls.
- ii. Regular Monitoring and Reporting: Set up procedures, including audits and reviews, for tracking and reporting on regulatory compliance.
- iii. Training and Awareness: Educate staff members on legal obligations and the value of adhering to them.
- iv. Risk Assessment: To identify and reduce compliance risks, regularly conduct risk assessments.
- v. Interaction with Regulators: Keep lines of communication open and honest with regulators to learn about upcoming changes and expectations.
- vi. Use of Technology: To expedite compliance procedures and lower the possibility of errors, make use of technological solutions such as regulatory reporting tools and compliance management systems.

Institutions can improve their capacity to comply with regulations and successfully manage financial risks by putting these methods into practice.

### **Emerging Trends in Financial Risk Management**

Technological advances are revolutionizing risk management by providing new tools and ways to improve decision-making and reduce risks, according to Acharya (2013). Blockchain technology and artificial intelligence (AI) are two significant developments in risk management:

#### **Artificial Intelligence (AI)**

**Machine Learning (ML):** ML algorithms can analyze massive datasets to find patterns and trends, which can improve risk prediction and mitigation.

**Natural Language Processing (NLP):** NLP is able to extract insights related to risk management from unstructured data, such as news articles and social media.

**Robotic Process Automation (RPA):** RPA can free up human resources for more strategic risk management activities by automating repetitive chores like data entry and report preparation.

### **Blockchain Technology**

**Immutability and Transparency:** Blockchain technology offers a decentralized, immutable ledger that securely records transactions, lowering the possibility of fraud and tampering (Shin, 2010). Self-executing contracts, or smart contracts, have the conditions of the contract explicitly encoded into the code. They can lower counterparty risk by automating and enforcing contractual obligations.

### **Future Outlooks for Financial Risk Management Practices**

- i. **Greater Integration of Machine Learning and AI:** These two fields will remain important for risk management because they allow for more complex risk modeling and analysis.
- ii. **Growth of Blockchain Applications:** To lower operational risks, blockchain technology is anticipated to be applied more and more in fields like supply chain management, trade finance, and identity verification.
- iii. **Pay Attention to Cybersecurity Risk:** As financial services become increasingly digitally integrated, managing cybersecurity risk will become much more important, necessitating the use of cutting-edge tools and techniques to fend off cyberattacks.
- iv. **Regulatory Technology (RegTech):** As RegTech solutions use technology to assist financial institutions in meeting regulatory standards, they will proliferate and lower the risk of noncompliance.
- v. **Enhanced Data Analytics:** Financial institutions will be able to better analyze and manage risks thanks to advanced data analytics approaches including prescriptive and predictive analytics.
- vi. **Agile Risk Management Practices:** To keep up with the ever-evolving market and regulatory landscape, risk management techniques will need to become even more flexible and agile.

## **Conclusion**

This chapter concludes by suggesting that financial risk management strategies offer a thorough overview of the different kinds of financial risks that businesses face as well as the methods and resources available to successfully manage and mitigate these risks. The essential ideas and best practices in risk management are covered in this chapter, covering everything from market risk to credit risk, liquidity risk, and operational risk. This chapter provides readers with the information and resources necessary to successfully negotiate the challenging terrain of financial risk management through a thorough analysis of regulatory requirements, technology advancements, and emerging trends. Organizations can improve their financial stability, guard against losses, and seize chances for expansion and innovation by appreciating the value of risk management and putting strong risk management procedures into place.

In today's complex and demanding financial landscape, this chapter will also be an invaluable tool for risk managers, financial professionals, and students looking to expand their knowledge of financial risk management. It will enable you to make well-informed decisions and support the success and resilience of your company. To sum up, technological advancements are changing the financial risk management scene by providing fresh chances to enhance judgment, boost productivity, and reduce hazards. Financial institutions will probably have a competitive advantage in the changing risk management market if they adopt these advances.

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CHAPTER 7

# INNOVATIVE SUSTAINABILITY: LEVERAGING PUBLIC PROCUREMENT FOR AFRICA'S ENTREPRENEURIAL GROWTH

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## Abstract

**P**ublic procurement is increasingly recognized as a powerful tool for driving innovation and sustainability, particularly in developing regions such as Africa. This chapter explores the potential of public procurement to foster entrepreneurial growth and sustainable development across the continent. It begins by defining sustainable public procurement (SPP) and explaining its principles and importance in achieving sustainable development goals. The unique challenges and opportunities for implementing SPP in African countries are discussed, highlighting the critical role of procurement policies in creating market opportunities for local entrepreneurs. Through an examination of how procurement policies can incentivize innovation and technological advancements, the chapter provides insights into the mechanisms by which public procurement can stimulate entrepreneurial activity. Several case studies are presented to illustrate successful initiatives where public procurement has driven entrepreneurial growth and innovation in Africa, offering practical examples and lessons learned. The chapter also delves into the necessary policy frameworks and institutional support required to build an

*enabling environment for sustainable procurement and entrepreneurship. The roles of governmental and non-governmental institutions in fostering such an environment are underscored, along with initiatives for capacity building to help entrepreneurs participate effectively in public procurement processes. In addressing the barriers to integrating sustainability and entrepreneurship into public procurement practices, the chapter proposes strategies to overcome these challenges, including policy recommendations and best practices. Future opportunities for enhancing the role of public procurement in driving sustainable entrepreneurial growth are discussed, providing a forward-looking perspective on the potential of procurement to shape Africa's economic landscape. The chapter concludes with a summary of key points, discussing the broader implications of the findings for policymakers, practitioners, and entrepreneurs. A call to action is made, encouraging stakeholders to adopt and support sustainable procurement practices to foster innovation and entrepreneurial growth in Africa. This comprehensive exploration underscores the transformative potential of public procurement in advancing both innovation and sustainability on the continent.*

## **Introduction**

### **Context and Rationale**

Public procurement, the process by which governments and public sector organizations purchase goods, services, and works, is a powerful tool that can drive significant socio-economic change. In recent years, there has been a growing recognition of the role that public procurement can play in fostering innovation and sustainability. By strategically directing procurement spending, governments can stimulate markets for innovative and sustainable products and services, support small and medium-sized enterprises (SMEs), and drive broader economic growth. This chapter explores how public procurement, when leveraged effectively, can serve as a catalyst for entrepreneurial growth in Africa, thereby contributing to the continent's sustainable development goals. In Africa, where many economies are still developing and grappling with high levels of unemployment and underemployment, particularly among the youth,

fostering entrepreneurship is critical. Entrepreneurs are often the drivers of innovation, bringing new products and services to market, creating jobs, and stimulating economic activity. However, many African entrepreneurs face significant barriers, including limited access to finance, markets, and business support services. Public procurement can help overcome these barriers by providing a stable and significant demand for goods and services, encouraging innovation, and fostering a competitive business environment. Public procurement accounts for a substantial portion of GDP in many African countries, representing a considerable economic lever. For example, in Kenya, public procurement represents about 10% of GDP, while in South Africa, it accounts for around 13% of GDP (Odhiambo & Kamau, 2013). Harnessing this spending power to promote sustainable and innovative entrepreneurship can lead to significant socio-economic benefits, including job creation, poverty reduction, and economic diversification.

### **Objectives**

The main objectives of this chapter are threefold, namely,

- i. It aims to explore the link between public procurement and entrepreneurship in Africa, examining how procurement policies and practices can be designed to support entrepreneurial growth.
- ii. It seeks to identify best practices in leveraging public procurement to drive innovation and sustainability, drawing on case studies and examples from across the continent.
- iii. It provides policy recommendations for African governments and public sector organizations on how to effectively harness public procurement for entrepreneurial growth, ensuring that procurement practices contribute to sustainable development goals.

By addressing these objectives, this chapter will contribute to a deeper understanding of the potential of public procurement as a tool for economic development in Africa. It will highlight the importance of strategic procurement policies and practices that not only meet the immediate needs of governments but also support broader economic and social objectives. Ultimately, the chapter aims to provide practical insights and recommendations that can help policymakers, procurement professionals, and entrepreneurs leverage public procurement to drive innovation, sustainability, and inclusive economic growth in Africa.

## **Conceptual Explanation of Key Concepts**

### **Innovative Sustainability**

Innovative Sustainability refers to the integration of creative and forward-thinking approaches to achieving long-term environmental, social, and economic sustainability. In the context of this study, innovative sustainability likely emphasizes how novel solutions and technologies can be applied to address sustainability challenges in a way that supports sustainable development goals. The study might explore how innovative practices and strategies can be integrated into public procurement processes to enhance sustainability outcomes, particularly in promoting environmentally friendly and socially responsible business practices in Africa.

### **Public Procurement**

Public Procurement refers to the process by which government and public sector entities acquire goods, services, and infrastructure from private companies. It is a significant driver of economic activity, often representing a large portion of public expenditure. In this study, public procurement is viewed as a powerful tool that can influence market behaviors and encourage businesses to adopt sustainable practices. The study may focus on how public procurement policies and practices can be leveraged to create demand for innovative and sustainable products and services, thereby driving entrepreneurial growth and sustainable development.

### **Sustainable Public Procurement**

Sustainable Public Procurement (SPP) is a subset of public procurement that specifically focuses on incorporating sustainability criteria into procurement decisions. This includes considerations of environmental impact, social responsibility, and economic viability over the life cycle of the products or services being procured. Within the context of the study, SPP is likely examined as a critical mechanism for promoting innovative sustainability. The study might explore how governments in Africa can implement SPP practices to encourage the development and growth of businesses that prioritize sustainability, thus fostering a market environment conducive to entrepreneurial innovation and long-term sustainable growth.

### **Entrepreneurial Growth**

Entrepreneurial Growth pertains to the expansion and development of new and existing businesses. It involves increasing the scale, market reach, and economic

impact of entrepreneurial ventures. In this study, entrepreneurial growth is seen as a crucial component of economic development in Africa. The research likely investigates how sustainable public procurement can act as a catalyst for entrepreneurial growth by creating opportunities for businesses that offer innovative and sustainable solutions. By prioritizing sustainability in public procurement, governments can stimulate the growth of a new generation of entrepreneurs who are focused on addressing environmental and social challenges through innovative means.

### **Interconnection in the Study**

The study likely posits that achieving Innovative Sustainability in Africa can be significantly advanced through the strategic use of Public Procurement, particularly by embracing Sustainable Public Procurement (SPP). By doing so, governments can not only promote sustainability but also drive Entrepreneurial Growth by creating favorable market conditions for businesses that innovate around sustainable practices. The study likely explores how these concepts can be effectively integrated to support sustainable development and economic growth across the continent.

### **The Role of Public Procurement in Sustainable Development**

#### **Defining Sustainable Public Procurement (SPP)**

Sustainable Public Procurement (SPP) refers to the acquisition of goods, services, and works by public authorities that are not only cost-effective but also beneficial to society, the economy, and the environment over their entire life cycle. SPP integrates sustainability considerations into procurement processes, ensuring that public procurement decisions contribute to sustainable development goals (SDGs).

#### **The Principles of SPP involve:**

- i. **Economic Sustainability:** Promoting economic growth by supporting local businesses, fostering innovation, and ensuring value for money.
- ii. **Environmental Sustainability:** Minimizing environmental impact through the procurement of green products and services, encouraging resource efficiency, and reducing waste and carbon footprints.
- iii. **Social Sustainability:** Enhancing social equity by supporting fair labor practices, improving working conditions, and promoting inclusive participation of marginalized groups in the procurement process.

SPP plays a critical role in achieving SDGs by leveraging public expenditure to drive sustainable practices in markets. For instance, SDG 12.7 emphasizes the promotion of sustainable procurement practices that align with national policies and priorities (United Nations, 2020). By adopting SPP, governments can stimulate demand for sustainable products and services, encouraging suppliers to innovate and improve their sustainability performance.

### **SPP in the African Context**

Implementing SPP in Africa presents both challenges and opportunities unique to the continent. The context of African countries varies widely in terms of economic development, institutional capacity, and market readiness. However, the overarching goal remains the same: to harness public procurement as a tool for sustainable development.

### **Challenges**

- i. **Institutional Capacity:** Many African countries struggle with weak institutional frameworks and limited expertise in sustainable procurement practices. Training and capacity-building initiatives are essential to equip procurement professionals with the necessary skills and knowledge (Akenroye, 2019).
- ii. **Financial Constraints:** Limited financial resources can hinder the adoption of SPP, as initial costs for sustainable goods and services may be higher. Budgetary constraints often prioritize immediate cost savings over long-term benefits (Ameyaw, Mensah, & Osei-Tutu, 2012).
- iii. **Market Availability:** The availability of sustainable products and services can be limited, making it challenging for public procurers to find suppliers that meet sustainability criteria. Developing local markets and encouraging the production of sustainable goods are crucial steps (Bolton, 2016).

### **Opportunities**

- a. **Economic Growth and Innovation:** SPP can drive economic growth by supporting small and medium enterprises (SMEs) and fostering innovation. By prioritizing local suppliers and sustainable products, governments can stimulate job creation and economic development (McCrudden, 2012).
- b. **Environmental Benefits:** Incorporating environmental criteria into procurement processes can significantly reduce the environmental

- impact of public sector activities. This includes promoting energy efficiency, reducing greenhouse gas emissions, and encouraging sustainable resource use (UNEP, 2017).
- c. **Social Equity:** SPP can enhance social equity by promoting fair labor practices and inclusive participation in procurement processes. This can help address social inequalities and improve the livelihoods of marginalized groups (Brammer & Walker, 2011).

Several African countries have made strides in implementing SPP practices. For instance, South Africa's Preferential Procurement Policy Framework Act encourages public entities to consider the economic empowerment of previously disadvantaged individuals when awarding contracts (Bolton, 2016). Kenya has also shown progress in green procurement, particularly in the energy sector, by prioritizing renewable energy projects (Odhiambo & Kamau, 2013). In conclusion, while the implementation of SPP in Africa faces significant challenges, the opportunities for driving sustainable development through public procurement are substantial. By adopting and scaling SPP practices, African countries can achieve significant environmental, economic, and social benefits, contributing to their overall sustainable development goals.

### **Linking Public Procurement and Entrepreneurship Creating Market Opportunities**

Public procurement has the potential to create substantial market opportunities for local entrepreneurs by expanding their access to government contracts and fostering demand for locally produced goods and services. By strategically aligning procurement policies with entrepreneurship objectives, governments can stimulate market growth and create a favourable environment for small and medium-sized enterprises (SMEs).

For instance, when governments set aside procurement opportunities for SMEs or local businesses, they provide these enterprises with a chance to compete in larger markets that they might not otherwise access. This approach can significantly boost local economies by increasing business revenues, creating jobs, and promoting local supply chains (OECD, 2016). For example, Nigeria's National Public Procurement Act includes provisions that favor local content and encourage the participation of local businesses in government contracts (Ogunmola, 2020).



Public procurement can also drive market opportunities by integrating criteria that favor sustainable and socially responsible practices. This not only enhances the visibility of local entrepreneurs but also aligns with broader sustainability goals, further boosting their market prospects (UNEP, 2017). By prioritizing vendors who adhere to environmental and social standards, procurement policies can create new avenues for business growth and encourage entrepreneurial activity in sectors like green technology and sustainable agriculture.

### **Innovation through Procurement**

Procurement policies can serve as powerful tools to incentivize innovation and technological advancements within local businesses. Governments can leverage procurement to drive innovation by including requirements that push for cutting-edge solutions, fostering competition among suppliers, and promoting research and development. For example, by mandating that suppliers meet high environmental or technological standards, procurement policies can encourage businesses to innovate to meet these criteria. The European Union's Horizon 2020 program exemplifies this approach by using public procurement to support innovative technologies and foster cross-sector collaborations (European Commission, 2018). Adapting similar strategies in Africa could accelerate the development and adoption of new technologies, particularly in sectors critical to the continent's growth, such as renewable energy and healthcare.

In Africa, procurement policies that focus on innovation can create a ripple effect across industries. For instance, South Africa's Green Economy Accord, which integrates green procurement principles, has stimulated advancements in sustainable technologies and practices among local firms (Pienaar, 2019). Similarly, Kenya's emphasis on e-procurement has spurred technological innovation and streamlined procurement processes, benefiting local tech entrepreneurs and enhancing overall efficiency (Githinji, 2020).

### **Case Studies**

#### **The South African Green Economy Accord**

The South African Green Economy Accord is a notable example where public procurement has driven entrepreneurial growth and innovation. This initiative focuses on promoting sustainable development through green procurement



practices, which has led to increased demand for green technologies and services. As a result, local entrepreneurs have benefited from new business opportunities and market expansion in the green technology sector (Pienaar, 2019).

### **Kenya's E-Procurement System**

Kenya's implementation of an e-procurement system has significantly enhanced procurement transparency and efficiency. By leveraging digital tools and platforms, the system has opened up new opportunities for local tech start-ups to provide innovative solutions and services. This case illustrates how public procurement can drive technological advancements and support entrepreneurial growth in the digital sector (Githinji, 2020).

### **Nigeria's Local Content Act**

Nigeria's Local Content Act is designed to boost local businesses by mandating that a significant percentage of procurement expenditures be allocated to local suppliers. This policy has fostered growth in various sectors, including construction and manufacturing, by creating a more competitive and inclusive procurement environment for local entrepreneurs (Ogunmola, 2020).

## **Building an Enabling Environment**

### **Policy Frameworks**

#### **Sustainable Procurement Policies**

Sustainable Public Procurement (SPP) is vital for aligning public sector purchasing with environmental, social, and economic sustainability goals. SPP ensures that procurement practices support long-term sustainability, reduce environmental impact, and promote social equity. Policies like the EU's Green Public Procurement (GPP) guidelines highlight criteria such as energy efficiency, reduced emissions, and social responsibility, which guide public procurement towards more sustainable practices (European Commission, 2021). For Africa, adopting similar frameworks can facilitate the integration of sustainability into procurement processes, thereby creating a market for eco-friendly products and services, while also supporting local entrepreneurs (Petersen, 2020).

#### **Local Content Policies**

Local content policies mandate that a significant portion of procurement spending be directed towards local businesses. This approach fosters local

industry development and economic growth. Nigeria's Local Content Act exemplifies how such policies can enhance local entrepreneurship by reserving procurement opportunities for Nigerian firms and ensuring that they gain from the government's spending (Ogunmola, 2021). Similar policies across African countries can stimulate local business development, create jobs, and foster innovation by ensuring that local firms are part of the procurement value chain.

### **Innovation-Driven Procurement Policies**

Policies that emphasize innovation in procurement can stimulate technological advancements and support emerging businesses. The UK's Innovation Partnership Programme demonstrates how public procurement can drive innovation by collaborating with SMEs to develop cutting-edge solutions for public services (UK Government, 2021). African governments can implement policies that encourage public sector organizations to engage with start-ups and innovative companies, thereby creating opportunities for entrepreneurs to showcase their innovations and contribute to public service improvements.

### **Institutional Support**

#### **Governmental Institutions**

Governmental institutions play a crucial role in shaping and enforcing procurement policies that support local businesses and sustainability. Agencies such as the South African National Treasury provide comprehensive guidelines and frameworks for procurement, ensuring that local businesses can compete effectively for government contracts (National Treasury, 2019). By establishing clear procurement regulations and offering support to local firms, these institutions can enhance the efficiency and inclusivity of procurement processes, thereby fostering entrepreneurial growth.

#### **Non-Governmental Organizations (NGOs)**

NGOs are instrumental in supporting entrepreneurial development through advocacy, technical assistance, and capacity-building programs. The African Development Foundation (ADF) supports local entrepreneurs by providing grants and resources that help them participate in public procurement and scale their businesses (African Development Foundation, 2020). NGOs also play a critical role in advocating for policy changes and providing platforms for entrepreneurs to access procurement opportunities and support services.

### **Public-Private Partnerships (PPPs)**

Public-Private Partnerships (PPPs) can leverage resources and expertise from both the public and private sectors to drive sustainable development and entrepreneurial growth. The Kenya Private Sector Alliance (KEPSA) illustrates how PPPs can enhance procurement practices by fostering collaboration between the government and private sector to improve business opportunities and procurement processes (Kenya Private Sector Alliance, 2019). These partnerships can facilitate the development of innovative procurement solutions and provide entrepreneurs with the support needed to thrive in competitive environments.

### **Capacity Building**

#### **Training and Development Programs**

Capacity-building initiatives that offer training and development opportunities are essential for preparing entrepreneurs to engage effectively in public procurement. Programs such as those provided by the South African Small Business Development Agency (SBD) help local businesses understand procurement requirements, compliance, and bidding processes (SBD, 2020). These training programs equip entrepreneurs with the skills and knowledge needed to navigate procurement systems and improve their chances of winning government contracts.

### **Mentorship and Advisory Services**

Mentorship and advisory services offer valuable support to entrepreneurs by providing personalized guidance and expertise. Networks like the African Business Angels Network (ABAN) connect startups with experienced mentors who offer strategic advice and practical insights into procurement practices (ABAN, 2021). These services help entrepreneurs refine their business strategies, improve their procurement capabilities, and enhance their competitiveness in the public procurement market.

### **Access to Information and Resources**

Ensuring entrepreneurs have access to information about procurement opportunities and requirements is crucial for their success. Platforms such as Ghana's eProcurement system centralize procurement information and streamline the bidding process, making it easier for local businesses to access opportunities and submit proposals (Ghana Public Procurement Authority, 2020). By providing timely and comprehensive procurement information,

governments and institutions can help entrepreneurs better navigate the procurement landscape and increase their chances of success.

## **Challenges and Opportunities**

### **Barriers to Implementation**

#### **Lack of Awareness and Expertise**

One significant barrier to integrating sustainability and entrepreneurship into public procurement practices in Africa is the lack of awareness and expertise among procurement officers and policymakers. Many procurement professionals may not fully understand the principles of Sustainable Public Procurement (SPP) or the benefits it can bring to entrepreneurial growth and sustainability (Eze & Chinedu-Eze, 2021). This gap in knowledge can result in missed opportunities to implement practices that support sustainable development and local entrepreneurship.

#### **Regulatory and Institutional Constraints**

African countries often face regulatory and institutional challenges that hinder the effective implementation of SPP. These challenges include bureaucratic inefficiencies, lack of clear guidelines, and inconsistent enforcement of procurement regulations (Mbaya, 2019). Additionally, corruption and lack of transparency in the procurement process can further complicate efforts to promote sustainability and entrepreneurship (Transparency International, 2020).

#### **Financial Constraints and Limited Access to Finance**

Entrepreneurs in Africa frequently encounter financial barriers that limit their ability to participate in public procurement processes. Access to finance is a critical issue, as many small and medium-sized enterprises (SMEs) struggle to secure the necessary capital to fulfil procurement contracts (Oluwajodu & Okoro, 2020). Furthermore, public procurement policies may require financial guarantees or significant upfront investments, which can be prohibitive for emerging entrepreneurs.

#### **Inadequate Infrastructure**

The lack of adequate infrastructure, such as reliable transportation networks, communication systems, and energy supply, poses a significant challenge to implementing sustainable procurement practices. Poor infrastructure can

increase the cost and complexity of delivering goods and services, making it difficult for local entrepreneurs to compete with established businesses (World Bank, 2018).

### **Strategies for Overcoming Barriers**

#### **Capacity Building and Training Programs**

To address the lack of awareness and expertise, it is essential to invest in capacity-building initiatives for procurement officers, policymakers, and entrepreneurs. Training programs that focus on the principles and benefits of SPP, as well as best practices for sustainable procurement, can enhance understanding and implementation (OECD, 2020). These programs should also include modules on entrepreneurship and innovation to equip participants with the skills needed to navigate public procurement processes effectively.

#### **Strengthening Regulatory Frameworks**

Enhancing the regulatory and institutional frameworks governing public procurement is crucial for promoting transparency, accountability, and consistency. Governments should develop clear guidelines and standards for SPP and ensure their consistent enforcement across all levels of procurement (United Nations, 2021). Additionally, implementing anti-corruption measures and leveraging technology for e-procurement can help reduce bureaucratic inefficiencies and increase transparency.

#### **Facilitating Access to Finance**

To overcome financial barriers, governments and financial institutions should work together to create financing solutions tailored to the needs of entrepreneurs. This could include providing low-interest loans, credit guarantees, and grants specifically designed for SMEs participating in public procurement (International Finance Corporation, 2019). Additionally, establishing procurement policies that offer flexible payment terms and reduce upfront financial burdens can make it easier for entrepreneurs to compete for contracts.

#### **Investing in Infrastructure**

Addressing infrastructure challenges requires significant investment in transportation, communication, and energy systems. Public-private partnerships (PPPs) can play a vital role in mobilizing resources and expertise to

develop and maintain essential infrastructure (African Development Bank, 2019). By improving infrastructure, governments can reduce logistical barriers and create a more conducive environment for sustainable procurement and entrepreneurial growth.

### **Future Opportunities**

#### **Leveraging Technology for E-Procurement**

The adoption of e-procurement platforms presents a significant opportunity for enhancing transparency, efficiency, and accessibility in public procurement processes. E-procurement systems can streamline procurement activities, reduce corruption, and provide a level playing field for entrepreneurs (World Bank, 2020). By leveraging technology, African countries can create more inclusive and efficient procurement processes that support sustainable development and entrepreneurial growth.

#### **Fostering Innovation through Collaborative Networks**

Collaborative networks that bring together government agencies, private sector companies, academia, and civil society organizations can drive innovation and sustainability in public procurement. These networks can facilitate knowledge sharing, joint problem-solving, and the development of innovative procurement solutions (UNDP, 2019). By fostering collaboration, African countries can harness the collective expertise and resources needed to promote sustainable entrepreneurship.

#### **Promoting Green and Inclusive Procurement**

Future opportunities for public procurement in Africa include promoting green and inclusive procurement practices. Green procurement focuses on purchasing goods and services that have a minimal environmental impact, while inclusive procurement ensures that procurement opportunities are accessible to marginalized groups, such as women-owned businesses and youth entrepreneurs (ILO, 2021). By adopting green and inclusive procurement policies, African countries can support sustainable development goals and create more equitable economic opportunities.

### **Conclusion**

#### **Summary of Key Points**

This chapter has explored the transformative potential of public procurement in

fostering innovation and sustainability, with a particular focus on driving entrepreneurial growth in Africa. The key insights and findings include:

**The Role of Public Procurement in Sustainable Development:** Sustainable Public Procurement (SPP) plays a pivotal role in achieving Sustainable Development Goals (SDGs) by promoting environmentally friendly, socially inclusive, and economically viable procurement practices. The unique context of African countries presents both challenges and opportunities for the effective implementation of SPP (Eze, Chinedu-Eze, & Bello, 2020).

**Linking Public Procurement and Entrepreneurship:** Public procurement can significantly enhance market opportunities for local entrepreneurs by providing stable demand for their goods and services. Furthermore, procurement policies can incentivize innovation and drive technological advancements among local businesses. Case studies from across Africa highlight successful instances where public procurement has been a catalyst for entrepreneurial growth and innovation (Mbaya, 2020; World Bank, 2021).

**Building an Enabling Environment:** A supportive policy framework, robust institutional support, and comprehensive capacity-building initiatives are essential to create an environment conducive to sustainable procurement and entrepreneurship. Policies should emphasize transparency, accountability, and inclusivity, while institutions should provide necessary financial and technical support to entrepreneurs (African Development Bank, 2019; OECD, 2021).

**Challenges and Opportunities:** Despite the potential benefits, integrating sustainability and entrepreneurship into public procurement practices in Africa faces several challenges, including regulatory constraints, financial limitations, and lack of awareness. However, with appropriate strategies such as policy reforms, capacity-building programs, and the adoption of e-procurement systems, these challenges can be effectively addressed (ILO, 2021; Transparency International, 2020).

#### **Implications for Policy and Practice**

The findings of this chapter carry significant implications for policymakers, practitioners, and entrepreneurs:

**Policy Development:** Policymakers need to develop and implement comprehensive SPP policies that prioritize sustainability and entrepreneurship. Such policies should include clear guidelines promoting transparency, accountability, and inclusivity in procurement processes (UNDP, 2020).

**Capacity Building:** There is a critical need to invest in capacity-building programs for procurement officials, policymakers, and entrepreneurs. These programs should focus on the principles of SPP, best practices, and the benefits of sustainable procurement to enhance knowledge and implementation (OECD, 2021).

**Institutional Support:** Both governmental and non-governmental institutions play a crucial role in fostering an environment conducive to entrepreneurial growth through procurement. This involves providing financial support, technical assistance, and platforms for collaboration and knowledge sharing (African Development Bank, 2019).

**Leveraging Technology:** The adoption of e-procurement systems can streamline procurement processes, reduce corruption, and increase access for entrepreneurs. This technological shift is vital for enhancing efficiency and transparency in procurement practices (World Bank, 2021).

**Inclusive Procurement Practices:** Policies and practices that promote green and inclusive procurement can support environmental sustainability and ensure that marginalized groups, such as women-owned businesses and youth entrepreneurs, can participate in public procurement (ILO, 2021).

### **Call to Action**

To harness the potential of public procurement in driving innovation and sustainable entrepreneurial growth in Africa, all stakeholders must take proactive steps:

**Governments:** Develop and enforce comprehensive SPP policies that prioritize sustainability and entrepreneurship. Invest in infrastructure and capacity-building initiatives to support local entrepreneurs (Eze, Chinedu-Eze, & Bello, 2020).



**Private Sector:** Embrace sustainable procurement practices and collaborate with governments and other stakeholders to foster innovation and inclusive economic growth (Transparency International, 2020).

**Educational Institutions:** Incorporate SPP and entrepreneurship into curricula to equip future leaders with the knowledge and skills needed to drive sustainable development (UNDP, 2020).

**Civil Society:** Advocate for transparent and inclusive procurement practices and hold governments accountable for implementing policies that promote sustainability and entrepreneurship (ILO, 2021).

**Entrepreneurs:** Actively engage in public procurement opportunities, seek out capacity-building programs, and innovate to meet the demands of sustainable procurement (World Bank, 2021).

By adopting and supporting sustainable procurement practices, stakeholders can contribute to a more innovative, inclusive, and sustainable economic future for Africa.

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CHAPTER 8

# BEHAVIOUR DISORDERS OF CHILDHOOD AND ADOLESCENCE: IMPLICATIONS FOR EDUCATION IN NIGERIA

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## Abstract

**C**hildren manifest behaviour disorder at some point in their lives which is quite normal. It becomes worrisome when the disorders persist over a long time. The impact of this on the educational achievement of these children is better imagined than spoken about. This paper explores how behaviour disorders of childhood and adolescence impact on Sustainable Development Goals (SDGs) particularly on education. It examined the meaning of psychopathology, prevalence and types of disorders, causes, effects and treatment approaches with the hope that the knowledge of this will help teachers to take appropriate steps to help the affected children.

**Keywords:** Behaviour disorder, Adolescence, Childhood, Sustainable Development Goals (SDGs)

## Introduction

All young children display impulsive or deviant behavior occasionally. Sometimes, this is a part of a normal emotional reaction, but if these behaviors are extreme or outside the norm for their level of development, it could be a sign of a behavioral disorder. Children's misbehavior in schools has become a topical

issue in the Nigerian society of today. The general consensus is that children of today exhibit more deviant behaviors than their counterparts in the past. Childhood and adolescence disorders encompass a wide variety of behavioral problems which range from pervasive developmental disorders, which may severely affect many aspects of development and are clearly abnormal, to the less severe developmental disturbances which are exaggerations of behavior problems shown by most children e.g. truancy and stealing. Therefore, not all aberrant behavior should be characterized as disordered. For example, bed-wetting, exhibiting tantrums (shouting excitedly and wildly, not being able to talk by a certain age and so on) may not be too deviant. Family bereavement, moving a home suddenly or starting school may cause some disturbances in children's behavior for a short period. These more or less situational behavior disorders are relatively normal but when they become prolonged or profound, there are indications that underlying problems that require thorough investigations.

In an attempt to curb these maladaptive behavior, school authorities and teachers have adopted some drastic measures such as physical punishments and other ruthless measures. The school scene in many cases is characterized by children's expulsion from school, child flogging and detention after school, making a child kneel under the sun, and the use of derogatory and denigrating words such as 'mumu', 'coconut head' and other uncomplimentary words. Many children have become so used to these labels and probably so enraged that they sometimes plan counter attacks either covertly or overtly. According to Denga and Akuto (2004), some children simply show gross immunity to all these drastic and hostile punishments.

### **Why focus on childhood and adolescence disorders?**

Some childhood and adolescence disorders resemble disorders in adults. But as similar as they may look, childhood and adolescence disorders are best considered separately for specific reasons. For instance, in most childhood disorders, unlike adult disorders, age is an important factor in assessment of symptoms. For example, a two-year-old who assaults a new baby in the house is acting normally; a ten-year old who does the same thing is not acting normally. Bed-wetting to a three-year old may be normal, but abnormal in a fourteen-year old. The second reason for a focus on childhood and adolescence disorders is, the period from infancy through adolescence is filled with many rapid changes

that even very normal children may develop temporary psychological problems. The third reason is that the disorders of childhood and adolescence differ in course and outcome from adults' psychological disorders. The less severe childhood disorders are transitory. Children for example, are more likely than adults to recover from phobias. Lastly, unlike adults most children do not think of themselves as suffering from psychological problems. Therefore, it is important that adults recognize the psychological problems that children are prone to and help them out of it. Since parents often attribute most abnormal behavior in children to witchcraft, remote controls, charms and so on. The knowledge of psychopathology will enable parents and teachers understand childhood problems and thus take appropriate steps to correcting them. If parents are aware that complications during pregnancy and childbirth are associated with disorders like hyperactivity, hearing defects, infantile autism and delinquency symptoms and so on, such problems will be better managed.

Additionally, to attain the goal of universal primary education which is one of the goals of Sustainable Development Goals (SDGs) a focus on the disorders of children is essential as this will arrest the problems and enhance school enrolment, retention and performance. Ignoring or paying inappropriate attention to such disorders among children constitutes a big obstacle to the attainment of the Sustainable Development Goals. This chapter intends to examine the various definitions of psychopathology, the prevalence and types of some psychopathological disorders that impair the proper functioning of children in schools, their classifications, possible causes, effects and treatment approaches. This knowledge will improve teachers' ability to recognize abnormal and normal behaviour in school children and take appropriate steps to help. Finally, the implications of childhood and adolescence behavior disorders for the Sustainable Development Goals.

### **Conceptual literature**

#### **Behaviour Disorder**

Behavioural disorders are very common in children and involve a pattern of disruptive behaviors that can cause problems at home and in social settings. If left untreated in childhood, behaviour disorders can have a detrimental effect on a person's ability to maintain and hold down a job or perform well socially. The US Department of Health Services describes behavioral disorders as involving "a pattern of disruptive behaviors in children that last for at least six months and cause problems in schools, homes and in social situations." They are those



behaviors that are detrimental to other people, which neither promotes learning nor interpersonal relationship.

Akuto and Ojogbane (2008), define it as a concept which refers to either the study of mental illness or mental distress, or the manifestation of behaviors and experiences, which may be indicative of mental illness or psychological impairment. They use the concept interchangeably with psychopathology which they used to denote behaviors or experiences, which are indicative of mental illness, even if they do not constitute a formal diagnosis. Psychopathological behaviors are certainly a fusion of maladaptive behaviors and body disorders. This means human behavior influences body functioning and disorders can influence behavior. For instance, brain injury can lead to psychological manifestations; depression and anxiety can affect physical health of an individual.

Behavioral disorders are different from the challenging behaviors children sometimes display. Almost all children will have tantrums, or act in aggression, angry, or defiant at some point. While challenging, these behaviors are a normal part of childhood development. Often, they are the result of some strong emotions that the child is expressing in the only way they know how. As a result, healthcare professionals only diagnose a behavioral disorder when the disruptive behaviors are severe, persistent and outside the norm for the child's developmental stage. Behavioral disorders are also different from autism spectrum disorder (ASD), which is an umbrella term for neurodevelopmental conditions that affect how some children communicate, socialize and process sensory stimuli. ASD may cause behaviors in children that caregivers find unusual or challenging but these are the result of how they experience the world.

### **Behavior disorders of childhood and adolescence.**

#### **Prevalence**

Knopf (1984), reported that surveys in the United States and Great Britain have shown that 7 percent of children have moderate to severe disorders and 15 percent mild disorders. The big question is when these problems begin. The age at which behavior problems in childhood begin is not fixed. Bootzin et al (1993), reported that admission rate begins to increase for children with behavior problems from age six to seven years in the West. This corresponds to the age of beginning school. It appears the stress of starting school coupled with home situation may exacerbate psychological problems in children. Rosen et al (1964)

said behavioral problems peak at the age of 14/15 years. This peak may probably reflect the inherent developmental difficulties or crises period of adolescence. Eme (1979) stated that in every age group, clinic admission rates are higher for boys than girls, sometimes 2 or 3 times higher. In Nigeria, children's behavior in school has become a major topic of unfavourable discussion recently. Such behaviors range from mild forms of stealing, cheating, bullying, truancy, hooliganism etc. Other more disturbing forms include; mood disorder, attention deficit, hyperactivity, anxiety and so on.

For everyday mild behavior problems at primary and secondary school levels in Nigeria, school authorities use various aversive measures such as scolding, flogging, kneeling, suspension or even expulsion from schools to curb these abnormal behaviors. Yet due to the effect of poverty and globalization leading to further weakening of our social systems that check such problems in our society, such behaviors seem to be on the increase. Moreover, the more severe behavioral problems are not well attended to because they are not within the competence of the teachers. This problem is compounded by inadequate numbers of guidance counsellors in schools arising from insufficient numbers of trained counsellors and the general unwillingness of government/school authorities to engage and support guidance counsellors to provide counseling services in the school. In spite of these gaps, we cannot overlook the serious consequences of more severe behavioral problems on children's academic performance and social adjustment in the Nigerian school system. Denga and Akuto (2004), warned that unresolved learning difficulties arising from behavior disorders in children may become compounded in adulthood and impair a total adjustment in later life.

### **Types of Childhood Behavior Disorders**

The following sections look at specific behavior disorders common in children and their symptoms:

#### **Disruptive Behavior Disorders**

Disruptive behavior disorders constitute behaviors that constantly break the rules, disrupt the lives of those around them and defy authority. While oppositional behavior is common in very young children and teens, in extreme cases it can require professional assessment and intervention. They are characterized by poorly controlled, impulsive, act out behavior in situations in which self-control is expected. This happens due to failure to learn self-control at appropriate ages. For instance, hungry infants cannot be expected to

be patient and not cry. However, when they are toddlers and preschoolers, expectations for behavior control behavior by command don't touch this, do that etc. Children who have not learnt these skills but continue to be disruptive, impulsive and aggressive, are at high risk for school adjustment difficulties, learning problems and peer rejection (Bootzin, et al, 1993). Disruptive behavior can be classified into two distinct categories. In oppositional defiant disorder, the rules broken are chiefly those within the family and school; regular temper tantrums, failure to accept responsibility for bad behavior and frequent defiance of parents and teachers. In conduct disorders, aggressive behaviors threaten others, like people and animals, bullying, lying, stealing and truancy may also be identified.

### **Attention Deficit Hyperactivity Disorders (ADHD)**

ADHD is one of the most common behavioral problems among children, adolescents and adults. In children it causes difficulty focusing attention. It can also cause hyperactivity and impulsivity. There are three ADHD subtypes with the diagnosis depending on the symptoms the child displays most often. The subtypes are: a) inattentive type, b) hyperactive impulsive type and c) combined type. A child with inattentive type ADHD may:

Find it difficult to pay attention;

- i. Become easily distracted;
- ii. Have difficulty focusing on tasks, particularly long tasks such as reading;
- iii. Start tasks but forget to finish them;
- iv. Appear not to listen to instructions or to forget them.

A child with hyperactive-impulsive type ADHD may:

- i. Find it difficult to stay still or remain seated
- ii. Fidget a lot by tapping the hands, feet, or moving around in their seat
- iii. Run around or climb things when it is not appropriate
- iv. Frequently interrupt conversations or games
- v. Have difficulty waiting for their turn
- vi. Have trouble talking or playing quietly

A child with combined ADHD will exhibit a mixture of the above behaviors. Doctors often diagnose ADHD after the age of 6. This is because the symptoms can be more apparent when a child starts school, and struggles to adjust to more quiet, sedentary activities.

### **Effects of ADHD on School Performance**

This inability to focus and sustain attention has a serious effect on the academic performance of children. Children with ADHD have great difficulty following instructions and finishing assigned tasks. They frequently even cannot remember what they set out to do. Consequently, however intelligent they are, they often have severe learning problems. They are extremely disruptive in the classroom, making incessant demands for attention. Children with ADHD also show poor social adjustment. They disrupt games, get into fights, refuse to play fair and throw temper tantrums. Such behavior does not make them popular with their peers (Bootzin et al, 1993). Klein and Mannuza (1991) found out that ADHD continues into adolescence at which point, it sometimes branches into anti-social behavior. Many ADHD children also develop conduct disorders.

ADHD children exhibit serious lack of attention. In fact, they cannot concentrate on one thing for more than 5 minutes before moving their attention to another more interesting thing to them. A teacher therefore needs to keep their attention from wavering (Akuto & Ojogbane, 2008).

### **Conduct Disorder (CD)**

Children with Conduct Disorder tend to violate basic social rules and the rights of others. This can have a significant impact on someone's academic, social and home life. It can develop both in childhood and adolescence.

The symptoms of Conduct Disorder (CD) include:

- i. Aggression, which may result in physical fights, bullying behavior, forcing someone into sexual activity (rape) and animal cruelty.
- ii. Destruction of property, such as setting fires or damaging possessions.
- iii. Deceitfulness, such as lying or tricking others.
- iv. Significant rule-breaking, such as not going to school, running away, or stealing.

Many young people with CD have difficulty interpreting the behavior of others. For example, they may believe a person is behaving in a hostile way toward them when they are not. This causes them to escalate toward aggressive or violent behavior. People with CD may also have difficulty feeling empathy, or have another condition, such as anxiety or post-traumatic stress disorder that affects their thoughts and behavior. Akuto and Ojogbane (2008), divided the syndrome into two types; the first is the solitary type characterized by a lack of emotional attachment and by aggressive anti-social behavior. Children in this category are

the closet parallel to adult antisocial personalities. They may lie, steal, set fires, break into houses and constantly get into fights with others. What is most striking about them is not their aggressive behavior but their apparent callousness. Children who fit into this category seem to be precociously devoid of feelings (Bootzin, et al, 1993). They often have no real friends, and show little attachment to their families and the feeling is often mutual. The second type of conduct disorder which is the group type differs markedly from the solitary aggressive type in that it includes normal emotional attachment. Children in this category have friends, indeed, they belong to a gang, and are decent and loyal to their members. Regardless of specific diagnosis, children with conduct disorders are a cause for grave social concern whether in gangs or on their own, these children commit many crimes, many of which are serious.

### **Etiology of Conduct Disorders**

Psychoanalytic view explains that antisocial and delinquent behaviour in children are symptoms of an underlying anxiety conflict in a child. These conflicts result from an inadequate relationship with the parents. This inadequate relationship may result from either emotional deprivation or overindulgence. In the case of emotional deprivation, if childhood conflict is not resolved the super ego does not develop adequately. Such children become unable to form close personal relationships with others. In the case of overindulgence, the child displays aggression freely and does not develop internal control over aggressive behavior (Bootzin et al, 1993). Working with families of conduct disordered children, Patterson (1986), expressed the view that antisocial behavior is the result of parental failure to effectively punish misbehavior. The child's failure to learn to respect authority generalizes to the school setting, resulting in poor academic performance and peer relations.

### **Consequences of Conduct Disorders**

Conduct Disorders pose a grave social concern. In the US, about 72,000 juveniles are housed in correctional institutions for antisocial behavior. (Rutherford et al in Sue & Sue, 1990). In Nigeria, the rising wave of crime among youths is indicative of this problem. Conduct disorders are associated with poor disciplinary, academic problems and negative interaction with peers (Walker et al, 1987). Conduct disorders unlike some childhood and adolescents most often persist into adulthood. Conduct disorders in adulthood are often expressed in criminal behavior, antisocial personality and problems in marital and occupational adjustments (Kazdin, 1987).

### **Oppositional Defiant Disorder**

Children and adolescents with ODD display an ongoing pattern of hostile behavior toward authority figures, such as parents, caregivers, or teachers. Unlike conduct disorder, children with ODD tend to violate minor rules, rather than major rules and social norms. The child often loses his or her temper, defies rules, refuses to do chores and blames others for his or her mistakes (Sue and Sue, 1990). The deficient behavior is mainly directed towards parents, teachers and others in authority.

The signs of ODD include:

- i. Temper tantrums and irritability
- ii. Argumentative behavior, such as constantly questioning rules
- iii. Persistent stubbornness, which may manifest as a refusal to follow instructions or apologize for behavior
- iv. Provocative behavior, such as intentionally annoying or upsetting others
- v. Spiteful or vindictive attitude

It is worth noting that some clinicians have criticized the concept of ODD, arguing that it medicalizes normal child behavior. It is common for children to behave angrily or defiantly when they are unhappy, so it can be difficult to distinguish between ODD and behavior that is related to stress. Doctors can only diagnose ODD if the behavior has been persistent for 6 months, causes constant disruption at home or school, and is not the result of another mental health condition.

### **Intermittent Explosive Disorder (IOD)**

- i. This disorder is often diagnosed in children over the age of 6. Children and teens with this disorder exhibit the following symptoms:
- ii. Frequent outbursts that are out of proportion to the situation.
- iii. Violent words and actions'
- iv. Behavior that causes damage to property and harm to both animals and humans.

### **Obsessive-Compulsive Disorder (OCD)**

OCD is characterized by persistent, uncontrolled, and intrusive thoughts, urges, and actions. Symptoms may include:

- i. Engaging in activities such as continual washing and cleaning
- ii. Repeating mantras or prayers

- iii. Adhering to rigorous schedules
- iv. A desire for things to be symmetrical and in order
- v. Repeatedly counting and checking things
- vi. Excessive worry about germs

OCD is a debilitating disorder that can make it extremely difficult to function normally. OCD can lead to additional issues such as bipolar illness, depression and anxiety.

**Bipolar disorder:** Bipolar disorder can start in childhood and continue throughout adulthood. It is a hereditary disorder that is frequently misdiagnosed or misidentified as ADHD. Bipolar disorder is characterized by frequent mood swings, in which the child alternates between feeling euphoric to deeply depressed.

**Anxiety disorder:** According to Zimbardo (1990), anxiety is the experience of apprehension and dread without an appropriate or causal determinant. Bootzin et al (1993) see it as a state of increased physiological arousal and generalized feelings of fear and apprehension. Everybody experiences anxiety. Anxiety disorder in children can cause them to have trouble sleeping or face difficulty performing at school or in social situations. The most common types of anxiety illness are Separation Anxiety Disorders and Avoidant Disorders.

**Separation Anxiety Disorder (SAD).** This refers excessive and persistent anxiety upon being separated from parents, home and other caregivers who the children are attached to (Bootzin et al, 1993). It peaks at about 12 months and then gradually disappears. In some children, however, it does not disappear but persist well into the school years. Children with this disorder are typically clinging and demanding, putting considerable strain on their parents. Parents-child conflicts then are common with separation anxiety disorder and of course exacerbate it, since the parents' annoyance makes the child all the more fearful of abandonment. This conflict may also extend to other areas. They may refuse to attend school and consequently their academic progress comes to a halt. Furthermore, since they cannot go to school or camp or other children's houses, they make no friends or lose the friends they had. Separation anxiety may produce such physical symptoms as vomiting, diarrhea and headaches. Other symptoms include enuresis, nightmares and somatic complaints as dizziness. Stomachaches and nausea (Holmes, 2013). During adolescence, the most



frequent symptoms of separation anxiety disorder involve physical complaints on school days.

**Avoidant disorder.** Children with this disorder feel severe anxiety in situations that involve contact with strangers or peers (Sue and Sue, 1990). It is similar to social phobia or avoidant personality disorder in adults. Fear of strangers is normal in children from about 8 months; most overcome it by about 2<sup>1/2</sup> and 3 years. The persistence of fear of strangers and peers becomes a problematic behavior (Akuto & Ojogbane, 2008).

**Consequences:** The response of children with this disorder is withdrawal. The withdrawal reaction interferes with the establishment of friendships, this result in very few friends for such children, they develop low rate of interaction with peers, deficit in social skills, anxious and unhappy. They are hypersensitive to rejection and criticism. This disorder may interfere with their academic progress and their social adjustment in general. Other effects might be low self-esteem and depression.

**Over Anxious Disorder:** This disorder in children and adolescents is characterized by excessive worry about future or past events, over concern about performance and constant need for assurance (Sue & Sue, 1990). The cause may be genetic or environmental. Mothers of such children, may model excessive anxiety in interpersonal relationship with their children. Bootzin (1993), said it is more common in families where parental love is made conditional or consistently on 'good' behavior.

**Consequences:** children with this disorder tend to have severe doubts about their own capabilities and likeableness. Such doubts lead them to constant approval-seeking behavior. This pervasive anxiety tends to breed failure, because, often, it creates the very problems that were anticipated.

#### **Risk factors associated with behavioral disorders in children**

According to MedicineNet, the following are risk factors for behavioral disorders in children:

- i. **Sex/gender:** behavioral disorders are more likely to affect boys than girls. It is unknown if the cause is hereditary or related to experiences with socialization.



- ii. **Brain development:** studies have reported that children with ADHD were noted to have less activity in regions of the brain that regulate attention.
- iii. **Learning disabilities:** Reading and writing difficulties are related to behavioral issues. Children with learning disabilities are two times more likely to develop behavioral problems.
- iv. **Anger issues:** Children who are difficult to control and exhibit aggressive tendencies from an early age are more likely to have behavioral issues later in life.
- v. **Family relationships:** Behavioral problems are more common in dysfunctional homes, characterized by domestic violence, neglectful parenting or substance abuse.

### **Habit Disorders**

The term habit disorders can be traced to the writings of Knight Dunlap (1932) and his book *Habits: Their Making and Unmarking*. As an experimental psychologist, Dunlap was interested in the nature of the learning process, and he believed that a wide range of problem behaviors developed through learning processes and could therefore be unlearned. They may occur in isolation or in the context of other childhood disorders. For instance, sleeping disorders usually accompany childhood anxiety; so is sleeping and eating disorders. Specific habit disorders include: Eating disorders, elimination disorders and sleep disorders.

### **Eating Disorders:**

The eating disorders of childhood and adolescence lie in the murky waters between those of adulthood *anorexia nervosa* and *bulimia nervosa*, and the feeding disorders of childhood. Early-onset eating disorders include anorexia nervosa. The younger the child, however, the more likely he or she is to present a 'typical' picture. Some children refuse to eat; some overeat while others prefer to eat "junk" food (Holmes, 1998). Irregular eating tends to affect health adversely and can thus disrupt learning. Freud and other psychologists have found that eating is related to a person's emotional life, and thus forms a crucial part of one's development. Children's feelings about eating are tied to their feelings about those who feed and care for them. Due to the close relationship, eating disorders such as obesity and anorexia reveal emotional problems. Whether anorexia nervosa or bulimia nervosa (binge eating), the implication is that they spoil the child and make eating the focus more than learning.

### **Elimination disorders**

These disorders relate to conflict developed in toilet training during childhood. Such training may run contrary to a child's natural impulses. Elimination disorders *Enuresis* and *Encopresis*, i.e. lack of bladder or bowel control respectively.

**Consequences:** these disorders also disrupt school learning by creating other emotional problems of stigmatization due to rejection from peers.

### **Sleep Disorders**

Sleep is essential for good health and is an important part of child and family life. Sleep supports homeostatic, cognitive, immune, and cardiovascular functions and is fundamental for a child's growth and development. Sleep disruptions can lead to cognitive and emotional challenges and affect family dynamics (Owens et al, 2010).

Sleep disorders include **Obstructive Sleep Apnea (OSA)** which are recurrent episodes of partial or complete upper airway obstruction associated with arousals, awakenings, or oxygen desaturations despite the respiratory effort. OSA disrupts normal sleep patterns and ventilation and is a cause of morbidity in children, **Childhood Insomnia** which are sleep or wake disturbances characterized by difficulties in initiating or maintaining sleep, ultimately leading to chronic sleeplessness, **Parasomnias** which are undesirable physical events or experiences during sleep onset, within sleep, or during arousal from sleep (Meltzer et al, 2010).

### **Implications of the knowledge of childhood and adolescence disorders for education in Nigeria**

Some of the behavior disorders of childhood and adolescence explained here are typical in Nigeria's pre-primary, primary and secondary schools with their attendant negative consequences. A focus on behaviour disorders in Nigeria's schools is very important because the abnormalities of childhood and adolescence need to be better understood for effective handling. Besides, there is the need for the attainment of educational goals in Nigeria which focuses on 'achievement of universal primary education and closure of the gender gap in education' (Alcala, 1994). Concerns for behavior disorders in children at these levels will contribute to narrowing the gender gap in education as well as provide

opportunities for children of all categories to benefit from universal education. The knowledge of classification, nature of presentation, etiology and management strategies as well as effect on academic and social adjustment will help parents, teachers, counsellors and other relevant agencies to assist children overcome such problems. Teachers particularly will have a better understanding of factors behind children's behavioral problems and take informed decisions on appropriate measures to help rather than generalize the same forms of punishment for all misconducts.

Parents' awareness of the fact that the root causes of some children's behavior disorders is in the home may improve the handling of their children. This should dissuade parents from attributing the cause of behavioral problems in their children to witchcraft, remote control practices etc. consequently, this will improve children's well-being and ensure a healthier school population for improved performance, productivity and development in the Nigerian education section. The knowledge of behavior disorder gives teachers a better understanding of individual child and thus equipping them to handle individual cases. As in normal human beings, where there are individual differences, so also there are differences in behavior patterns of children of school age. Knowledge of behavior disorders enables the teacher to individualize his teachings to give more attention to children with abnormal behavior. Teachers can adapt programmes that will particularly motivate and arouse interest in children with some behavior problems (e.g. hyperactive or attention deficit disorders) for better achievement in schools. Counsellors need to know psychological problems in childhood and adolescence so that they will be able to adapt, modify and relate with children with such problems. Counsellors who identify children with cognitive, psychomotor and behavioral problems will also be in a position to manipulate the environment to suit the children or make appropriate referrals.

### **Conclusion**

This chapter has covered definitions of behavior disorders, the prevalence and types of some behavior disorders that impair the proper functioning of children in schools, their classification, etiology and effects. Finally, the implication of childhood and adolescence disorders for education in Nigeria was discussed. In conclusion, essentially a preventative approach via the use of several agents of socialization (home, school and mass media) is necessary. Treatment and

management of these abnormal behavior in children is a joint concern of parents, teachers, school counsellors, the peer group, religious organizations, media and the society generally.

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CHAPTER 9

## OPERATIONALISING THE ENTREPRENEURSHIP PARADIGM IN NIGERIA

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### Abstract

**E**ntrepreneurship education has been identified as a critical tool for addressing unemployment and fostering self-reliance among Nigerian graduates. Despite its inclusion in the curriculum of Nigerian universities since 2006, the effectiveness of entrepreneurship programs remains limited. This paper examines the challenges facing the implementation of entrepreneurship education, particularly the disconnection between theoretical knowledge and practical skills necessary for self-employment. The study highlights the need for a more pragmatic curriculum, which emphasizes real-world applications, piloting entrepreneurial ventures, and mentoring. Additionally, the paper underscores the importance of addressing the perception gap among students regarding entrepreneurship as a viable career path. The findings suggest that a restructured curriculum and targeted interventions could better equip graduates for self-sustaining employment and contribute to national economic development.

**Keywords:** Entrepreneurship, Curriculum, Self-reliance, Unemployment, Nigerian universities, Economic development.

## **Introduction**

Essentially, human capital development as a veritable policy option in addressing poverty, in sustainable terms in Africa, via the entrepreneurship route is now a necessity. Previous efforts have not yielded the desired results. At the return to democratic governance in Nigeria in 1999, there was a significant steady but not an economic growth, which remained largely unable to achieve inclusiveness in a mono-product economy. However, in the bid to diversify the economy, promote inclusiveness and address poverty; the contribution of agriculture, as evinced in the 2014 re-based GDP figures perhaps was consistent with the apparently little progress in poverty reduction but that could not significantly address poverty in rural communities. Again, the pursuit of economic diversification policies and strong growth over the years have not translated into a significant decline in poverty levels. The introduction of entrepreneurship studies in the Nigerian universities in 2006, would have been a game changer since introduction of the programme 2006, (NUC 2018). However, the expectation was that the entrepreneurship programme should have engender self-paid job amongst the graduates and ultimately leading to self-reliance and with possibility of aiding a reduction in the consequences of poverty in urban poor. Given the present size of Nigeria's population and rapid population growth too, casual observers can readily equate these to labour force growth and perhaps a recipe for an enhanced GDP.

Therefore, it is needful to note that neither the number of people entering the labour force every year, which constitute the growth, nor the very size of the labour market are to be reckoned with as the main driver of GDP growth. Hence, the aggregate productive contributions of individuals in the labour force that enables productivity growth. The education policy that prioritised entrepreneurship is apt and by implication the annual expansion in the working-age population, could have therefore, contribute the greatest share of GDP growth Nigerian. Essentially, the policy was intended to enhance self-employment among the educated but unemployed graduates that common sight in Nigeria. This could be actualized through a pragmatic curriculum such that the policy will in due course engender job intentions that are entrepreneurial and self-paid in nature with a focus on fresh Nigerian university graduates. However, the efficacy of the curriculum for this entrepreneurial education should be interrogated. In examining the entrepreneurial curriculum, the content and methodology for curriculum content delivery are paramount in this regard.

The curriculum for entrepreneurial education may be recognised to be important and having impact distinctly from that of general and specific-discipline education. However, the entrepreneurial curriculum needs to address the general perceptions of entrepreneurship vis-à-vis paid employment. Most importantly the entrepreneurial curriculum in terms of content and delivery must sufficiently address entrepreneurial concepts and practical entrepreneurial skills that are necessary to enhance the graduates' pursuit of self-paid job. Although the pursuit of self paid job forms the focal point of entrepreneurial curriculum; yet attention must be given to how these interests are contextualized in terms content and the methodology of delivery. Hence, entrepreneurial education curriculum (content/delivery) serves as a deliberate effort by the university authorities aimed at enabling student's capacity to be an active participant in the labour market as being self-employed. The important role of university education and particularly entrepreneurial education, as a veritable means for the development of an individual for self-reliance in the immediate community and nation at large, is noteworthy (FRN-NPE 2014).

The preparedness of students for the labour market generally, and the self-employment, work environment is big prerequisite for the anticipated future impact of a self-reliant graduate. It is, therefore, needful to interrogate the possible benefits of entrepreneurial education programme in assisting students become fulfilled. In the university education system, the total development of the individual is carried out through the curricular (academic), co-curricular (quasi-academic) and extra-curricular (non-academic) programmes. While the curricular programme has to do with the curriculum content that involves direct classroom, laboratory and studio interaction between the students and the course faculty members. The prime target is for the course facilitators to enable learners' acquisition of specific academic-based knowledge and skills necessary for their future earnings and socio-economic existence. On the other hand, co-curricular activities do not necessarily involve direct classroom, laboratory or studio-interactions rather these are other quasi-academic events like fieldtrips, excursions, academic symposia etc, necessary for wholesome and practical learning experiences of the students. While the third aspect, extra-curricular activities are meant to help the physical, social and psychomotor development and perhaps, emotional intelligence of students. These will further contribute to their physical, emotional and social development, thus making them suitable for future self-reliant life.



Essentially, entrepreneurial education expected to incorporate all the aspects of curriculum; while the curricular content may be concerned with intellectual and skill-development, the co-curricular and extra-curricular may be concerned with the other areas of the human personality development for survival in self-paid jobs. However, the awareness and perception of students on the efficacy of these curriculums interplay in the programmes in the public universities have not received commensurate attention in Nigeria despite the obvious need of students to be prepared for the inherent uncertainties in Nigeria labour market. Therefore, the paper was aimed at outlining how entrepreneurial education should at best enable graduates' self-employment.

### **Entrepreneurial Education Curriculum for Self-reliance and Poverty Reduction**

Educational institutions are established to equip students with skills necessary to direct the affairs of man's society in the nearest future. Enueme, & Onyene (2010) submits that the development of any nations largely depends on youths' population generally and university students in particular. The concept of Entrepreneurship education for university students remained relevant in enhancing the catching up process in the ever-widening knowledge-gap, either between industries and the academia and vice-versa. Precisely, knowledge production has fundamentally changed Nguyen VM, Delle Palme C, Pentz B, Vandergoot CS, Krueger CC, Young N, Cooke SJ (2021). Presently, socially distributed, application-oriented, knowledge is in vogue. It is trans-disciplinary, and subject to multiple accountabilities (Nguyen et al., 2021). The new realm is practical application of knowledge to existential issues (Nowotny H, Scott P, Gibbons M, 2003; Albert, Gabrielle & Elden 2010). Proponents opined that knowledge is now centred and build on essentially different circumstances, moving away from the strict division of disciplines in the ivory tower of science, hence multi-disciplinary courses are emerging. As a result of this, emergent scenario universities are exposed to a shift in their earlier focus on the relationship between science and the economy; bringing with it many challenges, but also new opportunities to create and diffuse new knowledge through new technologies. Factors generating change in European higher education have been pointed seen to be the need for pragmatic knowledge (Kwiek, 2012). In the whole of this gamut of knowledge sharing phenomena is a new type of education; Borderless education – one of the consequences of the globalisation and digital transformation – has been a key enabler for the paradigm shift in knowledge creation.

As knowledge becomes more socially available and penetrating to segment of the society that were neglected or hitherto unreached due largely to the emergence of the social media technologies, no single university, and indeed the higher education sector as a whole, can any longer claim to be the supreme repository of, and discovery agent for, knowledge (Albert, Gabrielle & Elden 2010; Kwiek, 2012). While physical communication and travel boundaries have been broken down and altered between countries and continents, the global expansion of the sources of information and knowledge. Even the developed economy without stressing much the issue of funding gaps, the academia has not fully kept up speed with these developments in the alternative communication channels, academic discoveries, and teaching processes, (Etzkowitz et al., 2012; Gallo 2018). There was a call for new approach to leadership and communication in the tertiary institutions. In the attempt to properly situate these issues, and while investigating this trend (Kwiek, 2012; Gallo 2018) examined the effects of higher education entrepreneurship, within the paradigm of scientific discovery, which is characterised by the domination of theoretical and experimental science, a divisionary taxonomy of disciplines. Using knowledge to a profitable end is the new paradigm, as it has been that universities were supported by public and private funding that is conditioned by the quality and extent of research and publications. Excellence has been viewed through the lens of peer review processes and particularly through the prism of publication in high-impact journals. This is now being challenged, (Okebukola, 2006; Kwiek, 2012)

There is a growing societal demand for universities to take up the role of translating and communicating knowledge to wider audiences. As, Gallo (2018) had solicited, that universities be active in developing ideas that are suitable for solving man's problems of transnational mobility. In transmitting higher education within and outside tertiary institutions, Universities, therefore, are increasingly impelled to enhance students' capacity through focus upon problem-centred approach. This is accomplished through academic interactions that cut across disciplinary boundaries and promote trans-disciplinarity. And the essence is to discover, exploit and share knowledge in new ways. Hence, sourcing for knowledge, partnerships for learning, multi-disciplinary interventions and other related efforts to discover, exploit and share knowledge in new ways are festering. As well, there is a growing societal demand for universities to take up the role of translating and communicating knowledge

to wider audiences in the UK, and perhaps other countries that perceive universities as having an essential mission to stimulate and facilitate learning that results in graduates with cutting-edge, discipline-specific knowledge and broad social and transversal skills (Kwiek, 2012). Tying different sources of information and knowledge together into a dynamic and open learning environment requires also interdisciplinary and flexibility in knowledge packaging, (Etzkowitz 2012). These developments are stimulating the spread of innovation and skills for business start-ups in the developed climes (Kwiek, 2012)

In Africa, about 60 per cent of the 200 million youth population are unemployed (Aganga. 2013). In some other sub-Saharan African countries, like Sierra Leone, specifically 70 per cent of the youth population, many of them being fresh graduates, were unemployed (UNDP 2021). The problem is still severe in the present time even as even among graduate youths that in theory should possess more skills sought by employers to gain a competitive advantage (ILO 2013; Msigwa & Kipasha 2013). Thus, the competition for jobs among graduates has become intense, as the traditional education system is no longer a passport for graduates to gain secure employment in the twenty-first century (Nabi & Walmsley 2006). This stark reality has a damaging consequence on the economic development of the country and the personal development of youths in general (ILO 2015). To this end, the Government of Sierra Leone has in the context of Agenda for Change, which is in line with its Poverty Reduction Strategy Paper (PRSP II), implemented a new legislation for youth-friendly initiatives that are focused on creating an environment that is conducive to youth employment, development, entrepreneurship and empowerment.

### **Entrepreneurship Policy vis-à-vis Graduates' Self-employment**

In a study (Ofili., 2014), titled; Challenges Facing Entrepreneurship in Nigeria- that adopted a descriptive survey design. It was revealed that promoting entrepreneurial education should be through direct teaching in universities and other tertiary institutions and that appropriate curriculum is required. Much earlier, Ogundowole, (2002), in a similar study: Alternative Structures for Enhanced In-depth Specialized Knowledge in Higher Institutions. Stressed that curriculum content and delivery must seek a departure from the tradition chalk-talk approach to a more pragmatic content delivery. However, a recent study, statistical significance between Entrepreneurship Education and how it

influences entrepreneurial intention among university students in Kenya. The Spearman's rho correlation coefficient was mostly applicable as the variables in question were categorical (measurable on either nominal or ordinal scale of measurement). Using the Spearman's rho correlation coefficient, the value of correlation coefficient was found significant at  $P=0.01$  significance level (with double asterisk) and the value of correlation coefficient is significant at  $P=0.05$  significance level, so, the curriculum is a significant factor in the determination of entrepreneurial intention. The data was further analysed it was found that entrepreneurial intention of students could be influenced by the curriculum offered in the course of study of the respondents. A cross tabulations in SPSS for Entrepreneurship Curriculum testing whether it was too theoretical too practical and its effect in inculcating entrepreneurial intention among selected entrepreneurship students who enrolled in entrepreneurship class. The relationship was found to be statistically significant. Using the Chi-Square ( $X^2$ ) test statistic it was revealed that the  $t=0.607$ , and the respective probability value (P-Value) in the asymptotic significance column is 0.023 which is less than the significance level, 0.05 or 5%, This means that there is 0% chance to find the expected and the observed in association, (or a larger) degree of association between the variables if they are perfectly independent in the population and so the rule of inference was that this relationship was statistically significant. conclusively, Entrepreneurship Curriculum was found to be too theoretical and lacks practical application.

In another study, Olokundun (2018), had differed in approach, but not far from the earlier findings. The goal of their study according to Olodokun, et.al, (2018) was to examine the influence of the contents of an entrepreneurship curriculum as it relates to the entrepreneurial development of university students in Nigeria. It was descriptive research, adopting a quantitative content analysis followed by qualitative thematic analysis to examine the data collected through a survey. The instrument consisted of a semi structured interviews conducted on entrepreneurship educators in a selected university in Nigeria. Results from the analysis showed that most educators opined that majority of the students in the selected university are able to develop critical thinking abilities and business idea generation competencies. However, the results also showed that the educators were of the opinion that most students are not able develop the confidence, commitment, and drive for the achievement of entrepreneurial goals and aspirations upon completion of their programmes. The study of

Olodokun, et.al, (2018), concluded that entrepreneurship curricula in Nigerian universities should be reviewed to motivate the development of entrepreneurial mindset and action. Though the study was not able to establish a nexus between curriculum and entrepreneurial intention, it also recommended that real-life scenarios should incorporate into the curriculum delivery mechanism.

### **Piloting Approach in Operationalising Entrepreneurship for Self-reliance**

- i. **Ensuring efficiency** - one of the essential elements in sustainable business start-up that can possibly help to navigate the challenges of gestation period is to ensure efficiency. This can be achieved by piloting - undertaking a pilot business start-up project prior to the actual, large-scale business start-up will promote the efficiency in carrying-out an actual business. As a strategy, the need to test the entrepreneurial skills acquired by fledgling entrepreneurs using a smaller capital and other necessary resources will be worthwhile effort.
- ii. **Ensuring optimal use of resources** – As stated already regarding piloting the business start-up, this particularly became necessary because if errors in investment decision occurs at an early pilot stage, there would be a lesser chance of wastage and loss especially when the entrepreneur may have obtained the working capital as loan subject to short pay-back period. Practical experience testing of the waters proves a veritable approach that government should devote little seed capital as a way of ensuring eventual optimal use of resources including the right human resources.
- iii. **Identifying Sources of Capitals and Investment Options** -The curriculum of entrepreneurial are not covering this essential aspect of entrepreneurship programmes. More so, resolving issues in planning, managing and implementing a new business – an emphasis on outlining possible sources of cheap capital can present many other benefits such as a more thorough exploration of sources, may reveal a particular loan scheme that may potentially have an antagonistic impact on the business results and profitability.

- iv. **Testing Skills, Clarity of Understanding and Identifying Mentoring needs** - Fledging entrepreneurs and their mentors can be assisted in determination of whether the fledging entrepreneurs were able to follow the directions as indicated and whether they were able to efficiently handle the new business setting-up process. It also provides better information on whether the approach adopted by entrepreneur will likely deliver the desired profitable results.
- v. **Challenges and Innovations** -as the entrepreneur is faced with diverse real-life challenges, it offers a firsthand opportunity to fledging entrepreneurs to seek for other better and smart ways of doing things. Free and open-source software can be used for inventory control, accounting, invoicing, stocks and storage management for a fast production of reliable results generally and value-added new start-up orientation.

Additionally, it should be considered that the knowledge gained during the pilot may vary between regions, sectors, and persons -depending largely on the individual differences in terms of level of exposure, world views and dexterities. If a particular piloting experience has good coverage and identified the target population or demographic characteristics, such as the right type of establishments in sectors and region are known or otherwise, this can lead to a considerable increase or decrease in profitability. Moreover, evidence from literature (Ogundowole, 2002; Ogochukwu, 2016; Bloomberg 2021) suggests that engagement of resource persons and incorporation of practical activities would motivate learners, perhaps, ensure the development of entrepreneurial skills that begets also the drive and commitment required for students to engage in entrepreneurship after graduation.

### **Conclusion**

Essentially, a spotlight on entrepreneurial education which was intended to be actualized through a pragmatic curriculum such that the policy will in due course engender self-paid employment. However, as the efficacy of the curriculum for this entrepreneurial education was dissected, such that students could receive a holistic view of how to be successful in the world of work as self-employed. Particularly, in adjudging the programme in terms of how beneficial the curriculum content and delivery has enabled students' preparedness for

entrepreneurial star-ups and the well-being of the individual students and the enrichment of the quality of their academic outputs in due course.

### **Suggestions**

From the findings it is hereby recommended that:

- i. There should be considerable setting of standards in the various universities on the how best to expedite actions in enhancing students, awareness on entrepreneurship.
- ii. Particularly the graduating students' level of skills acquisitions should be monitored through practical aspect of entrepreneurial education curriculum and how it concerns them in running their own business in the long run;
- iii. Addressing the observed low level of perception on the importance of entrepreneurial education programmes in Nigeria universities as seen in literature could be aiding graduating students' unpreparedness for self-employment;
- iv. It is noteworthy that the preference for white collar jobs among graduates clearly indicates that much should be done to sensitise not just the students but all stakeholders within and outside the entrepreneurial education settings;
- v. As there is a need to always engage resources persons with specific mandate to evolve practical mode of entrepreneurial knowledge delivery such the participants will be in better position to demonstrate what is learnt practically;
- vi. piloting can best be explored as a veritable option in developing the dexterity of fledging entrepreneurs without tears or unbearable loss in the real world of business.

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CHAPTER 10

# UNLOCKING PATHWAYS FOR ENTREPRENEURIAL FINANCE IN NIGERIA; ADDRESSING KEY CHALLENGES AND HARNESSING STRATEGIES

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## Abstract

**E**ntrepreneurial finance is the employment of financial instruments and processes to design, finance, manage, and assess a business venture. This article explores the challenges and strategies of entrepreneurial finance in Nigeria. The role and function of entrepreneurial finance in promoting economic growth and development in the Nigerian economy cannot be over emphasized. This is owing to the fact that it offers entrepreneurs with the essential funds and resources to commence and expand their business ventures, create ample employment opportunities, and contribute largely to the advancement and progress of the country. Through efficient management of their finances, entrepreneurs can drive their businesses towards sustainable growth, productivity and profitability, which sequentially will have a positive effect on the Nigerian economy.

**Keywords:** Entrepreneurial Finance, Ventures, Economic Growth, Development, Profitability

## **Introduction**

Irrespective of how feasible one's business idea is, one significant factor of startup success is the capacity to acquire and secure sufficient finance to begin, grow and develop the enterprise. Cash is not just another element in the business world. It is a key factor that oils the growth and development of an enterprise, drives innovation, and pushes its success. This is actually spot-on when it concerns entrepreneurship, where securing, dealing, organizing and increasing finances are indispensable for the sustenance, growth and development of a business irrespective of where the business is operated and Nigeria is not an exception.

The role and function of entrepreneurial finance in the progress, expansion and advancement of startups and small businesses in Nigeria cannot be over emphasized. Without entrepreneurial finance, the steering wheel of the Nigerian economy which obtains the provision of skilled and semi-skilled labour, modern-day expertise and technology, and apparatus for creation of wealth to meet the recognized requirements for profit making, makes the quest of economic growth and development an illusion (Akinola, 2014). Entrepreneurial finance involves the management and organization of scarce financial resources to promote startups, business growth, innovation, cost-effectiveness, increased productivity and lucrativeness. Hence, it is imperative for entrepreneurs who carry their operations in Nigeria to comprehend the rudiments of entrepreneurial financing.

According to Johnpaul (2023), entrepreneurial finance includes numerous facets, comprising of acquiring and securing funds, allocating and distributing scarce resources, and handling and managing risks. Entrepreneurs ought to get the essential skills, proficiencies, expertise and erudition to effectually transverse the dynamic financial environment and make knowledgeable decisions, assessments and judgements. When entrepreneurs are devoid of a sound comprehension of entrepreneurial finance, they are likely to encounter financial issues such as raising and accessing cash, financial forecasting, and management of cash (Timespro, 2023). The Nigerian economy has a huge population of over 200 million people and its vivacious entrepreneurial environment provides several openings for ambitious entrepreneurs. Though, circumnavigating the financial difficulties peculiar to the Nigerian business environment necessitates a profound knowledge of the indigenous financial

surroundings, investment opportunities, regulations and licensing (lendsqr, 2023).

Additionally, entrepreneurial finance offers the essential instruments for entrepreneurs to measure, evaluate and assess the feasibility of their business designs, attract prospective investors, and obtain cash. It aids entrepreneurs in recognizing, classifying and reducing risks, ensuring effective allocation and distribution of their scarce resources, and achieving sustainable growth and development of their businesses. A fundamental knowledge of entrepreneurial finance is vital for entrepreneurs operating in Nigeria. It enables them to make well-informed and knowledgeable financial decisions, access funds, and navigate the intricate financial scenery. By gaining the basic skills and knowledge in entrepreneurial finance, entrepreneurs can increase their possibilities of success and play a major role in Nigeria's economic growth and development.

### **The Concept and Scope of Entrepreneurial Finance**

The concept of entrepreneurial finance has generated a lot of discourse among scholars in the field of management and social sciences. There are clear-cut signs that the field of entrepreneurial finance is a fast-growing research area (Denis, 2004). Numerous academics have provided several definitions regarding entrepreneurial finance. According to Cumming, (2007); Kerr, Lerner, and Schoar (2014), entrepreneurial finance is the analysis of allocation of resources and values, which are utilized in new enterprises. It deals with crucial problems facing a lot of entrepreneurs such as: how much funds can and ought to be raised; when would it be raised and from what sources; what is the rational assessment of the startup; and how would financing contracts and exit decisions be planned, designed and arranged (Smith & Smith, 2000; Denis, 2004; Winton & Yerramilli, 2008; Salamzadeh, 2015).

Johnpaul (2023) sees entrepreneurial finance as those monetary choices, decisions, actions and undertakings carried out by entrepreneurs in commencing, expanding, and managing their ventures. It involves making and implementing financial decisions as well as obtaining, financing, and managing of resources, which align with the entrepreneurial aims, objectives and goals. Entrepreneurial finance is the employment of financial instruments and processes to design, finance, manage, and assess a business venture (Sharma,

2021). Entrepreneurial finance has to do with the financial administration of a business as it advances through its life span, commencing with the stages of growth and lasting to when the entrepreneur reaps from the business.

Aleman and Andreoli (2018) opined that entrepreneurial finance characteristically comprises mostly private funding, as against public funding, when we are discussing corporate finance. It is the availability of monetary resources (equities and debts) for small and medium enterprises (SMEs) which includes grants and subsidies ("Global Entrepreneurship Monitor", n.d.). Entrepreneurial finance is different from corporate finance, because it is more integrative, comprising of the evaluation of qualitative concerns such as sales, strategic planning, personnel management, and marketing (Rogers, 2014). The procedure by which capital is acquired and financial decision are made for new ventures or startup is known as entrepreneurial finance (Corbo, 2021). It concentrates on obtaining funds to commence a business. Any process via which an entrepreneur makes decisions concerning funds for new and emerging ventures is seen as entrepreneurial finance. Entrepreneurs need funds for launching and commencing their operations in new ventures.

According to Diaz (2021), entrepreneur finance has to do with studies on resource allocation and value. It focuses on new ventures and difficulties business owners encounter in acquiring the cash required to evaluate if the venture can be stable financially. Entrepreneurial finance analyzes the utilization of financial management principles for new and upcoming ventures (Timespro, 2023). It tackles fundamental concerns in finance which entrepreneurs generally encounter such as raising funds, determining valuation, financial forecast, efficient monetary management, and planning exit strategies. Finance in entrepreneurship is frequently typified scarcity of resources, complexities, intricacies and high levels of uncertainty. Thus, making it exigent for entrepreneurial finance to create a positive financial awareness and quick-witted decision-making skills in individuals to propel their ventures towards growth, development and success.

The scope of entrepreneurial finance includes the following:

- i. **Financial Planning** – This is a key aspect of financial management. It is a process of assessing the capital required for achieving the organization's objectives. Furthermore, it deals with formulation of

financial policies with regards to the organization's management of cash, assets and investment.

- ii. **Fundraising** - a process of obtaining and mobilizing voluntary financial donations by appealing to individuals, businesses, or governmental agencies. Though fundraising usually signifies endeavours to raise cash for non-profit organizations, occasionally, it is used to recognize and solicit for investors or other sources of finance for non-profit enterprises
- iii. **Investment Evaluation** – This is the process of measuring or assessing if a planned or projected investment is worth carrying out. It is a significant phase in undertaking reliable financial decisions. Assessment can be performed at different periods of the investment decision-making process which includes pre-investment, investment, and post-investment.
- iv. **Financial Management** - This is concern with investing the obtainable, existing and accessible financial resources in a manner that grander business success and return-on-investment (ROI) is accomplished. Experts in the field of financial management plan, direct, organize, coordinate, and control all business transactions in an enterprise.

### **Components and Principles of Entrepreneurial Finance**

The main components of entrepreneurial finance include:

- I. **Startup Financing** – This refers to the capital that's employed to fund an enterprise venture. It's utilized for numerous reasons, such as setting up a business, purchasing real estate, engaging a team, acquiring essential instruments, launching a good or service, or expanding the company (Kirsch, 2022).
- ii. **Growth Financing** – This is a financing solution that offers businesses with the capital they require to grow (Montag, 2023). They are also referred to as debt finance options most suitable for funding high growth companies seeking transformation changes.
- iii. **Exit Strategy** – This refers to a contingency plan implemented by an owner of a venture to liquidate a position in a financial asset or get rid of tangible business assets after determined measures, standards have been met or surpassed (Hayes, 2023). It might be performed to leave a inefficient investment or close an unsuccessful venture. In this instance, the aim of the exit strategy is to reduce costs.

Principles of entrepreneurial finance include the following:

- i. Time value of money:** This is the idea that money is worth more in the present-day than in the future as a result of its potential earning capability, or on the other hand, to inflationary pressure (Semczuk, 2022).
- ii. Scalability:** Be it in a financial or business perspective, scalability is seen as the capacity of a company to grow without being hindered by its framework or available resources when it encounters increased productivity (Hayes, 2023).
- iii. Risk-return tradeoff:** This asserts that the possible return increases with an upsurge in risk (Chen, 2023). Employing this tenet, individuals link low risk levels with low likely returns, and high-risk levels with high possible returns.
- iv. Opportunity cost:** This refers to the likely gains that an individual, investor or business losses out on when picking or selecting one alternative over another (Fernando, 2023). Though opportunity costs cannot be forecasted with complete confidence, deliberating on them can bring about sounder decision making.
- v. Diversification:** This is a strategy in risk management, which generates a combination of numerous investments inside a portfolio (Segal, 2023). A diversified portfolio comprises of a mixture of different types of assets and investment mediums in an effort to reduce exposure to any particular risk.

### **Financial Theories and Entrepreneurship**

The financial theories that are related to entrepreneurship include the following:

**Agency Theory:** Developed by Michael C. Jensen in the 1980s with the aim of describing and predicting the actions of managers/investors. It differentiates between doyens and agents, the former representing groups that assign task or duties to the latter. For example, entrepreneurs and executives are frequently the agents of investors, who assign the duties over a business. The fundamental supposition of this theory is that both groups are self-centered and that the interests of doyens and agents differs. Thus, agents might take actions on behalf of doyens that are not in the doyens' benefits, which is referred to as an agency snag. For example, agents might take bigger risks than doyens

would need them too because agents are gambling with the doyens' funds. Agency snags are worsened when information asymmetry exists between doyens and agents. Usually, agents possess better information than principals since they are in control of daily decisions and are frequently closer to the business than doyens, who are normally investors to some extent detached from the business. Information asymmetry makes it hard for doyens to check the activities of agents, and it is impracticable for doyens to draw up flawless contracts to take care of all likely situations. Information asymmetry and incomplete contracts create perils in the agency such as adverse selection and moral hazard. The picking of agents that are not capable creates a problem termed adverse selection, while the choosing of agents that embezzle resources creates the problem of moral hazard. Embezzlement occurs in many forms, including free riding, evasion, and the too much use of freebies. Agency theoreticians recommend result-based incentives as means to align agent's interests with those of doyens. For example, venture capitalist usually let substantial number of shares in a startup be allotted to managers and employees as incentives to guarantee that they work regarding the objective of increasing the value of the company shares.

**Information Asymmetry Theory:** Information asymmetry occurs when two groups in an organization have access to diverse information concerning the exchange. In economics, it can be viewed as an alternative to the classical assumption of perfect information. It is recognized by regulators who formulated laws prohibiting insider trading. Insiders possess distinctive access to the true financial depiction of an organization and have an unfair benefit when purchasing and selling the organization stock (Aboody & Lev 2000). The management team of a company, for instance, the Chief Executive Officers possess fiduciary duties concerning their investors which demand that they are honest, available and approachable. In entrepreneurship, information asymmetry can be a possible cause for setback. For instance, entrepreneurs are very much aware of the actual potentials of their enterprises since they have privileged access to information regarding their clients and production matters. In contrast, the investors possess insufficient information concerning the factual prospects, thus, typically require a higher interest rate for reimbursement.

When entrepreneurs make unverifiable declarations or selectively disclose information, there is the possibility for investor's maltreatment. For instance,



when Elon Musk chirped about securing investment to take the corporation private, there was an encouraging reaction from investors, but the Securities and Exchange Commission was not awestruck. Originators/Initiators that are more specialized might possess better information regarding the prospects of an innovation inside the startup establishment team, but might not reveal it if it would demoralize the incentives of sales and initiators that are focused on the business. It is usual for initiators that are more specialized to direct on their business associates and management boards. Information asymmetry causes difficulties in commissioning amongst inventors and outside companies (prospective licensing associates) triggering the inventors to try to erect their own companies to take their inventions to the marketplace (Lowe 2001). Also, inside an organization, an inventor might observe more prospect in their technology than their bosses, urging them to turn out new technology into the new business. Balakrishnan and Koza, (1993) opined that information asymmetries might aid in elucidating why entrepreneurs and businesses frequently make poor choice of associates when going into joint ventures.

**Liquidity Restraint Theory of Entrepreneurship:** It is more regular to establish a new business among persons with better access to financial capital owing to the fact that financial capital makes it simpler in obtaining the necessary resources to commence business. Better-off individuals are expected more to go into entrepreneurship since they can risk their own funds (Evans & Jovanovic 1989). There are proofs that most workers in organizations go into entrepreneurship during liquidity occasions such as initial public offers and purchase of their parent companies which can place considerable funds in workers' hands that possess shares or options in the firm. Consequently, these workers, reddened with money now possess the financial liberty to set up new business from their parent company into autonomous firms (Stuart & Sorenson, 2003).

Hurst and Lusardi (2004) discovered several proofs of liquidity restraints, though just at the peak of the range, implying that only very affluent persons are possibly more to become entrepreneurs, while increase access to finance amongst less opulent persons might hardly make a difference. New business enterprises that are set up with huge financial resources that are accessible to them can expand much more without difficulty than those that go in with insufficient funds. Expansion is deemed crucial to financial performance via effectiveness.

Currently, events in crowdfunding and initial coin offerings, have made huge financial resources accessible for startups in several areas. The hypothesis would forecast that crowdfunded startups would do better than those not funded or get minimal funding. In addition, the hypothesis would forecast that startups, which commence with huge venture capital would perform better than all other types of startups. Generally, people have still not made a decision or formed an opinion about these hypotheses. Davila, Foster and Gupta, (2003) opined that a number of researches proposes that business enterprises that obtains venture capital get extra workers, which is positively correlated with equity value growth. Remarkably, other researchers reveal that setting up a business enterprise does not essentially need substantial resources, instead, access to funds might be more vital for growth of the firm (Davidsson & Honing, 2003).

**Pecking Order Theory of Entrepreneurship:** This theory was advanced in the 1980's by finance academics trying to comprehend businesses financing preferences. In addition, the theory has to do with entrepreneurs' preferences regarding financing choices. Financing choices consist of utilizing personal cash, putting profits back into the company, sales of equity to outside venture capitalist, and debts owed by banks. Information asymmetries among the entrepreneur and potential financial sources of the company is at the centre of this theory. Entrepreneurs and other insiders possess better information concerning the prospect and company operations than potential financiers since the former handle stakeholders and daily problems. Typically, financiers depend on financial statements and second-hand information offered by the management team of the company. While officials of the company have a fiduciary responsibility toward shareholders, i.e., they are lawfully obliged to be honest, there is still ample space for overestimation, underestimation, and muddying.

Usually, financiers request favourable terms and high interest rates to guard themselves against what they have no idea of in order to compensate for their informational disadvantages (Paul, Whittam & Wyper, 2007). Consequently, entrepreneurs are likely to have a preference in financing their business utilizing their own cash and profits of the company instead of succumbing to the expensive requests of outside investors and creditors. Normally, new equity investors request a higher rate of return on their investment than the founding investors, therefore entrepreneurs will characteristically choose loans.

Additionally, entrepreneurs favour short-term loans to long-term loans, as these will on the average have lower interest rates (Paul et al., 2007). In some kinds of companies, information asymmetries are more severe than for others. For example, companies with complicated business models that are hard for outsiders to comprehend will generally have grander asymmetries than simple business models that are simple to comprehend.

**Real Options Theory of Entrepreneurship:** This theory focuses on investments in real assets that are in composition akin to financial options, for instance, put and call options that permits investors to speculate on the upside or downside of shares without tying up excessive capital (Bowman & Hurry, 1993).

In the opinion of McGrath (1999), this theory ought to be better than the net present value analysis and other time value calculations, particularly under circumstances of ambiguity. The basic philosophy behind this theory is that an opportunity that is futuristic is valuable more than the one that is not. For instance, companies can be merged, a company can be denied of its assets to assist another etc. Hence, entrepreneurs and investors in businesses are right to see failure as a learning process that adds to the appraisal of potential projects. Real options reasoning decreases the social cost of failure and as a result raises the risk that prospective entrepreneurs and investors' desires to take in the nearest future.

Lee et al. (2007) employed real options logic to make a case that bankruptcy laws ought not to penalize entrepreneurs too harshly due to the fact it could have the unintentional effect of decreasing the number of persons chasing opportunities that are both extremely high risk and incredibly high in prospective reward.

O'Brian et al. (2003) discovered that persons contemplating entrepreneurial entry decisions appear to utilize a real options logic. They discovered that entrepreneurs are less probable to go into an industry where risks and uncertainties are greater and where investments are irremediable.

**Signaling Theory of Entrepreneurship:** This theory illustrates how companies commune with investors regarding their quality and intentions. For example, dividends and debts indicate quality since cheap or substandard

companies apparently cannot sustain interest payments throughout the long run (Bhattacharya, 1979). Also, this theory is employed in describing which startups is financed by investors and which do not raise capital. It recognizes a collection of signals sent by a company just about the period of an initial public offering (IPO). Signals might comprise of principal executive team physiognomies, originator participation, or angel investors or venture capitalists' presence. How these signals will influence the signal receiver's judgement is forecasted by this theory. Regarding their influence on consequent investments or valuations by private or public investors, signals can either be positive or negative (Connelly, Certo, Ireland & Reutzel, 2011). For instance, originator participation might be seen as a positive signal by investors in an IPO since it shows dedication to the business. Most studies consider only positive signals that are intentional owing to the inclination to subdue negative signals (Connelly et al., 2011). However, a number of negative signals are conveyed inadvertently as a consequence of several other action. The best signals are expensive and apparent because expensive signals are hard to forge, particularly if the signal cost is lesser for higher quality companies. Signals can fix information asymmetries, such as when entrepreneurs' confidential information regarding their business potentials are better to that of outsiders. For instance, entrepreneurs might be aware of the initial outcome of research and development schemes or primary sales statistics of a new commodity. Also, they might be told of encumbering litigations or trade union quandaries earlier than outsiders. This sort of information can in addition influence entrepreneurs' intents concerning the company, such as whether they wish to market their shares or remain in the far future (Connelly et al., 2011).

One fundamental postulations of this theory is that the signalers and signal receivers possess conflicting interests to some extent, if not, the signaler would have no cause not to completely disclose their personal information. Outsiders, for instance investors, might make better choices if they can gain access to the entrepreneur's confidential information, but since they frequently cannot have such access, nonetheless without substantial costs, signals are the resultant best thing. Signaling theory creates an unusual test to the flawless information supposition of economists. In addition, it defies human capital theories, since individuals might pursue education and training to signal their capabilities in fields that are difficult to examine precisely instead of truly obtaining the knowledge.

### **Sources of Entrepreneurial Finance in Nigeria**

Globally, a vital element for the growth and success of any business venture is access to sufficient funding and Nigeria is not an exception. In Nigeria, there are numerous options from which entrepreneurs can source for funds. This segment looks at the several sources of entrepreneurial finance in Nigeria:

**Bootstrapping and Self-Financing:** These are customary techniques for early-phase business ventures. Bootstrapping is a condition in which an entrepreneur commences a business with little funds, depending on cash other than external investments (Kenton, 2023). A person is said to be bootstrapping once they try to build a business venture from personal finances or the operating income of the new venture. Asokan (2023) defines self-financing or internal financing, as the venture's capacity to make sufficient cash flow from its operations to finance its growth and development. This implies that the business does not depend on external sources of funds, such as loans and advances or equity investments, to finance its operations. Entrepreneurs employ personal savings, sell personal properties, or depend on family and friends to raise cash. This method permits entrepreneurs to have complete control and ownership of their ventures.

**Informal Funding and Angel Investors:** Informal finance are funds gotten from family, relatives, friends or private moneylenders (Elston et al. 2016). Informal funding is an attractive and prevalent option for Nigerian entrepreneurs due to its relative speed, lesser preliminary transaction fees and freedom from collateral conditions. Ganti (2003), sees angel investors as individuals who provides initial seed funds for startup companies, typically in exchange for ownership equity in the company. Every so often, these investors bring industry experience, linkages and networks that are beneficial.

**Government Grants and Loans:** The Nigerian federal government provides numerous grants and loans to assist entrepreneurs. Programs like the N-Power programme, Government Enterprise and Empowerment Programme (GEEP), You-win programme, TraderMoni, etc. have been initiated by the Nigerian government to advance entrepreneurial activities by facilitating access to funds, training and other resources required for SMEs to flourish in the country (Onyemachi, 2023).

**Bank Loans, Advances and Commercial Lending:** The roles banks play in providing finance for Nigerian entrepreneurs is positive and significant for entrepreneurship development in the country (Adeleke & Elumah, 2018). Nigerian entrepreneurs can accost deposit money banks for loans and advances, line of credit, or overdraft facilities. But, accessing deposit money bank loans and advances might require collateral and this may pose a challenge for new businesses that does not have a proven track record.

**Venture Capital and Private Equity:** In Nigeria's business environment, venture capital and private equity have gotten substantial traction (Johnpaul, 2023). They offer capital in exchange for equity and vigorously aid new enterprises with skills, knowledge, mentorship, information, networks, industry connections and expertise. Additionally, they allow entrepreneurs to measure their businesses swiftly.

**Crowdfunding and Peer-to-Peer Lending Platforms:** In recent times, crowdfunding and peer-to-peer lending platforms have appeared as alternative means of finance. Crowdfunding involves the utilization of small amounts of funds from a huge number of persons to fund a new business (Smith, 2023). It utilizes the ease of access of extensive networks of individuals via social media and websites to bring stakeholders, investors and impresarios together, with the prospect to improve entrepreneurship by increasing the group of investors beyond the conventional set of proprietors, kin, and venture capitalists. These online podia allow entrepreneurs to raise cash from people who have faith in their venture. Entrepreneurs in Nigeria can choose from the above discussed sources of entrepreneurial finance. However, each has its benefits and concerns, thus, entrepreneurs should thoroughly assess which option best suits their growth and development goals.

### **Challenges in Accessing Entrepreneurial Finance in Nigeria**

There are several challenges in accessing entrepreneurial finance in Nigeria and according to Johnpaul (2023) these include the following:

- I. Inadequate Financial Knowledge:** A lot of Nigerian entrepreneur's battle with inadequate financial knowledge, particularly with respect to financial management. They might not comprehend basic financial concepts, ideas, theories, models etc. and this will significantly impede their capability to access, evaluate, and efficiently manage entrepreneurial finance.

- ii. High Interest Rates and Strict Lending Requirements:** Entrepreneurs in Nigeria frequently encounter high interest rates on loans and advances, coupled with strict lending requirements. Deposit money banks and financial institutions impose stringent conditions, thus, making it hard for entrepreneurs to access funds. These high interest rates and strict lending requirements create major hindrance in obtaining and accessing entrepreneurial finance.
- iii. Inadequate Collateral and Proven Credit Records:** A lot of entrepreneurs operating in Nigeria struggle with inadequate collateral and credit records over and over again. Numerous entrepreneurs in the country do not have prized assets that can be employed as collateral for loans and advances. Furthermore, they might not have proven and verified credit records, thus, making banks and other creditors doubtful of their capability to pay back the loans. This inadequate collateral, proven and verifiable credit records makes it quite difficult for entrepreneurs to get access to funds to carry out their operations in Nigeria.
- iv. Corruption and Bureaucratic Difficulties:** Corruption is prevalent in the Nigerian economy and this has significantly hindered the access to entrepreneurial finance. Furthermore, bureaucratic snags in Nigeria also contributes in restricting access to entrepreneurial finance. Time and again, entrepreneurs in the country encounter bribery demands, unnecessary paperwork, red tape, unfriendly rules and regulations, etc. These practices obstruct, hamper and slow down the procedure of obtaining entrepreneurial finance, hence, creating an ecosystem characterized by lack of confidence, mistrust and uncertainty (Johnpaul, 2023).
- v. Insufficient Venture Capital and Angel Investors:** In Nigeria, the amount of venture capital and number of angel investors who are keen in financing entrepreneurial activities are insufficient. A lot of entrepreneurs find it difficult to get investors that want to undertake risks related with startups. Also, they find it challenging to raise adequate venture capital for their entrepreneurial activities and this hinders their options for funding entrepreneurial ventures in the country.



### **Strategies for Successful Entrepreneurial Finance in Nigeria**

Due to the challenges entrepreneurs encounter in accessing entrepreneurial finance in Nigeria, numerous strategies have been proposed by scholars for successful access to entrepreneurial finance in the country and these include:

**i. Development of Financial Knowledge and Management**

**Proficiencies:** The development of financial knowledge and management proficiency is a key strategy in accessing entrepreneurial finance and this can be obtained through attending seminars and workshops, taking online financial courses and reading financial articles, journals textbooks, magazines etc. to increase your knowledge of entrepreneurial finance. In addition, getting mentorship guidance from prosperous entrepreneurs, becoming a member of finance associations, learning from industry professionals and constantly educating yourself concerning financial rules, trends and regulations will also increase your comprehension of entrepreneurial finance.

**ii. Creating a Robust Business Plan and Financial Forecast:** This includes carrying out an effective market research to collect and source data for the business; state clearly the business objectives, aims, target population, and competitive advantages; planning an accurate financial forecast that shows the business earnings, expenditure and profitability; consistently appraising the business plan to take into consideration modifications in the industry; getting feedback from experts, consultants and mentors to ensure the feasibility, reliability and practicability of the business plan.

**iii. Creation of Convincing Creditworthiness and Collateral:** This involves keeping a decent credit record by ensuring timely payment of bills and debts; developing a sound credit history by means of sensible borrowing and repayment; make collateral or sureties available to obtain loans and improve your creditworthiness; frequently appraise your credit report to detect, sort out and solve any mistake, error, problem or concerns; set up contacts with deposit money banks and other financial institutions to improve your credit profile.

**iv. Networking and Getting Mentorship:** This includes going to entrepreneurial conferences, business meetings, and corporate events to enlarge your networks; becoming member of professional bodies or associations concerning your area of business; effectively engage skilled and knowledgeable entrepreneurs, take their advice, guidance,



assistance and leadership; establishing a network of communication within the entrepreneurial industry that can offer support and vital information; taking part in numerous mentoring programs related to entrepreneurship to get valuable insights from productive entrepreneurs.

- v. **Search for Other Finance Options:** This involves conducting several researches and regarding various crowdfunding platforms as a means of obtaining finance from a wider audience; seeking for government aids, grants, loans, or subsidies available for small and medium scale enterprises; searching for angel investors or venture capitalists that might be enthused in participating in your enterprise; making use of peer-to-peer loaning/lending daises that link debtors/borrowers with individual creditors/lenders; examine microfinance institutions that focus on delivering financial facilities and services to entrepreneurs. With the execution and implementation of these strategies, entrepreneurs operating in Nigeria can enhance their possibilities of efficiently acquiring, handling and administering entrepreneurial finance. Furthermore, increasing and improving financial literacy, designing and establishing a robust business plan, creating creditworthiness, making contacts and networking, as well as searching for other financing opportunities are vital to the success of entrepreneurial undertakings in Nigeria.

### **Conclusion**

This paper explored the components, concept, principles, and scope of entrepreneurial finance in Nigeria. The significance of financial management in entrepreneurship and the main strategies that entrepreneurs operating in Nigeria can embrace to efficiently handle their finances were emphasized. We critically looked at the numerous sources of entrepreneurial finance available in the country and examined their suitability for different kinds of enterprises. In addition, the challenges and opportunities of entrepreneurial finance that are present in the nation's financial scenery were adequately discussed.

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CHAPTER 11

## OPTIMALLY HARNESSING THE POTENTIALS OF SOYBEAN FLOUR IN ADDRESSING UNDERNUTRITION IN AFRICA

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### Abstract

**S**urvival is of the fittest and the fittest are those who can feed well and adequately even in the midst of adversity. Under-nutrition is a two-edged sword that is both the cause and consequence of poverty. Soybean is a relatively cheap source of complete protein, oil and micro-nutrients needed for good health and sustenance but there is need to ascertain the optimal processing method of its flour which is a prerequisite in most culinary application of the wonder bean. The objective of this study was to determine the culinary processing method that maximally preserves the nutrients and phytochemicals in soybean while concomitantly reducing the antinutritional factors to the barest minimum. Soybean was processed into soybean flour by the following methods: Roasting (ROSB), Soaking and roasting (SRSB), Soaking and boiling (SBSB) while the raw soybean was also processed into flour to serve as control (RWSB). The proximate, phytochemical and antinutrients composition of the soybean flours were determined using standard procedures and compared with the control. Mean data were compared using Analysis of Variance (ANOVA) at  $p < 0.05$ .

*Roasting maximally preserved the proximate composition followed by soaking and roasting. Soaking and roasting maximally reduced the antinutritional factors and also conserved the total phenolic and flavonoids content notably. Soaking and roasting of soybean before milling into flour is therefore an optimal culinary processing method since it appreciably conserved the proximate and phytochemical composition while maximally reducing the antinutritional factors. Soaking and roasting of soybean is hereby recommended in the production of soybean flour which is a prerequisite for many dishes in the culinary use of the wonder bean.*

**Keywords:** Soybean flour, processing methods, nutritional composition, phytochemicals, antinutrients.

### **Introduction**

Poverty can be defined as a state of having insufficient resources or income. It is lack of basic human needs that are necessary for sustenance such as adequate and nutritious foods, clothing, housing, clean water and health services. United Nations Development Program (2003) defines poverty as a complex phenomenon that generally refers to inadequacy of resources and deprivation of choices that would enable people to enjoy decent living conditions. World Bank (2005) expatiated more by defining poverty as hunger, lack of shelter, being sick and not being able to see the doctor, losing a child to illness due to unclean water, powerlessness, lack of representation and freedom. Undernutrition is one of the major consequences of poverty and is common among the low-income group. A poverty-stricken individual or household will not have adequate access to nutritious food, good health services and care as well as good sanitation and hygienic environment. All these culminate into worsening the undernutrition state since the individual or household will be prone to infection and diseases in the already weak immunity as a result of undernutrition.

Soybean is a legume crop that is a source of complete protein that is present in animal food sources. Legumes are one of the world's most important sources of food supply especially in the developing countries in terms of food, energy as well as nutrients. As a legume, soybeans are an important global crop that provides oil and protein for users (Robbani *et al*, 2022). It is known as an oil seed, however, after processing, it is utilized as a food ingredient. Soybean's unique



chemical composition on an average dry matter basis is about 40% of protein and 20% of oil. This composition makes it to rank highest in terms of protein content among all food crops and second in terms of oil content after peanut (48%) among all food legumes (Adelakun *et al.*, 2013). Furthermore, soybean is a very nutritious food crop. It is the richest source of protein among plant foods (Adelakun *et al.*, 2013).

If properly processed and prepared soybean can be a relatively cheaper source of valuable nutrients compared with food sources from animals. As it is rich in vital nutrients soybean is also a rich source of antinutrients such as trypsin inhibitors, phytate, oxalate, tannin, saponin, etc. These antinutrients interfere with the digestion of nutrients and reduce their bioavailability in the body, hence, they must be reduced to the barest minimum before soybean can be consumed. In Nigeria 1kg of soybeans costs N3000, 1kg of beef is about N10,000 while 1kg of powdered milk costs N10,000. This shows that soybean is quite cheaper than beef and milk which are comparable to it in nutritional composition, especially with respect to protein, fat and other nutrients. Soybean flour is a necessary prerequisite to many food products prepared from soybeans hence there is need for a clear understanding of processing method that optimally preserves the nutritional composition and phytochemicals in soybean while simultaneously reducing the antinutritional factors maximally. This study determined the optimal processing method of soybean flour.

## **Literature Review**

### **Causes of Poverty in Africa**

According to Crawford and Abdulai (2009), Poverty may be caused or exacerbated by:

- i. The lack of capacity of the poor to influence social processes, public policy choices and resource allocations.
- ii. Low capacities through lack of education, vocational skills, entrepreneurial abilities, poor health and poor quality of life.
- iii. The disadvantaged position of women in society.
- iv. Exposure to risks through lack of financial, social or physical security.
- v. Low levels of consumption through lack of access to capital, social assets, land and market opportunities.
- vi. Exposure to shocks due to limited use of technology to stem effects of drought, floods, army worms, crop pests, crop diseases, and environmental degradation.

- vii. inadequate environmental protection measures.
- viii. Lack of macro-economic stability that erodes the resources of the poor through inflation and other variables.
- ix. The inability of the national economy to optimize benefits within the global system.
- x. Habits and conventions based upon superstition and myths giving rise to anti-social behaviour.
- xi. Other factors leading to vulnerability and exclusion.

Poverty in Africa is caused by corruption and poor governance, poor land utilization and land tenure system, civil wars and unending political conflicts, poor infrastructure, diseases and poor health facilities, the World Bank and IMF policies, among others (Crawford and Abdulai, 2009).

#### **Undernutrition as a cause and Consequence of Poverty**

Undernutrition can be likened to a two-edged sword that is connected to poverty as a cause as well as consequence. An undernourished individual or household is prone to ill health thus reducing the working capacity and productivity hence leading to low income and ultimately poverty. In the same vein undernutrition can be a consequence of poverty because an impoverished individual or household will lack enough financial resources to access nutritious foods, adequate health services, clean water, good sanitation and care, education etc thus being subjected to undernutrition. Despite abundance of natural resources, the gross domestic product per capita of many African countries is among the lowest of list of nations of the world. According United Nation in 2009, 22 of 24 nations among the “Low Human Development” nations of the world on the UN's Human Development Index were found in sub-Saharan Africa (Adeyeye et al., 2021). Out of the 50 countries on the United Nation list of least developed countries, 34 of them were in Africa. According to FAO data over 200 million people in sub-Saharan Africa were undernourished in 2014-2016 (Adeyeye et al., 2021). The prevalence of undernourishment in sub-Saharan Africa rose from 181 million in 2010 to 222 million in 2016. In 2016, Africa had the highest prevalence of undernourishment in the world and estimated to be 20% of the population (Adeyeye et al., 2021). While this was alarming in Eastern Africa where one-third of the population is suspected to be undernourished. In a similar data, World Bank also found that sub-Saharan Africa Poverty and Equity Data was 47% with over 500 million people in abject poverty in 2012 (Adeyeye et al., 2021). Poverty is the major cause of hunger and malnutrition in

Africa while hunger and malnutrition escalated the problem of diseases in African continent. Poverty has continued to torment Africa as a result of poor and harmful economic policies, conflict and war, environmental factors like drought and climate change and population growth, poor leadership and greed (Adeyeye et al., 2021). COVID-19 pandemic has however exacerbated, the problem of poverty, malnutrition and diseases which has been escalated and in many African countries people find it difficult to make ends meet.

### **Overview of Soybean Flour**

Soybean (*Glycine max*) is a pea family member that grows well in tropical, subtropical, and temperate climates. Soybeans belong to the family leguminosae constitute one of the oldest cultivated crops of the tropics and subtropical regions. Soybeans are probably the most important oil seed legume which has its origin in Eastern Asia, mainly China (Adelakun et al., 2013). The cultivar *Glycine max* is thought to be derived from *Glycine ussuriensis* and *Glycine tomentosa* which grow wild in China, and can be found in great quantities in Asian countries such as Japan and Indonesia (Adelakun et al., 2013). Soybean was first introduced in Nigeria in 1908 but the first successful cultivation was in 1937 with the Malayan variety, which was found to be more suitable for commercial production in Benue State, North-Central, Nigeria (Nwodo and Okoye, 2023) Nigeria has been the largest producer of soybean in sub-Saharan Africa (Nwodo and Okoye, 2023).

Soybean is valued as a productive and adaptable crop which fits well into the cropping pattern of varying agro-climatic conditions. Soybeans are generally considered as high versatile seeds which have about 365 applications in the formulation of both human foods and other industrial raw materials (Nwodo and Okoye, 2023). Soybean is particularly very unique for different reason and hence classify as a valuable and economical agricultural commodity. The seeds vary in shape and color depending on the cultivar. In shape, they can be spherical to flatten while the color varies from white, yellow and brown to black. Also, the chemical composition of each variety of soybeans differs from each other. Features that motivate researchers to explore its utility in a wide range include the good quality and functionality of its proteins, surplus availability and low cost (Adelakun et al., 2013).

Soybeans are becoming a popular food component around the world due to their high nutrient content. Industrial and domestic processing of soybean has given

rise to numerous products utilized for both human and animal consumption (Omotayo *et al.*, 2007). It is directly used for plant-based food products such as soy milk, tofu, and soy sauce. Soybean can be processed to give soybean flour which could be mixed with wheat flour as a food ingredient for developing functional foods to produce a wide variety of baked goods such as bread and biscuits (Robbani *et al.*, 2022). In particular, soy flour is used to fortify traditional cereal-based foods. Soybean-fortified maize has been the subject of biochemical, nutritional, sensory and rheological evaluations (Ntso *et al.*, 2017). Soy flours are products obtained by finely grinding full-fat dehulled soybeans or defatted flakes made from dehulled soybeans. In order to be called soy flour, at least 97% of the product must pass through a 100-mesh standard screen (FAO, 2017).

Soy flour is commonly used as a protein source in industrial fermentations (Portal and Jones, 2003). As an essentially natural product, the composition of soy flour can vary from year to year as a result of changes in growing conditions (Portal and Jones, 2003). The different states of soy flour include full flat flour, defatted flour, soy protein concentrate and raw soy flour. Soybeans in the form of full fat flour, concentrate, isolate and texturized proteins have been used in a wide range of food products. These attributes made soybeans to be considered as an ideal food for meeting the protein needs of the population. As a result of high protein content in soybean, it can be used as a substitute for expensive meat and meat product (Adelakun *et al.*, 2013). The beans are highly rich in fibre and could be utilized in the liquid, powdery and curd forms for human consumption and as feed for millions of livestock (Nwodo and Okoye, 2023).

Soy flour, which is high in protein, has recently attracted attention for the development of flour-based functional foods. Properly defatted soybean flour will contain 50% or more of protein. Soybean flour has huge potentials of being used to enrich foods in order to provide adequate nutrients for individuals not meeting daily needs (Adelakun *et al.*, 2013). The soybeans protein has been developed for use in hospital diets, particularly for post – operative diets and soybean flour protein concentrates and isolates have been incorporated into infant foods, such as rice-and – wheat-based foods, in order to increase protein content (Ugwu and Nwoke, 2011). Soy flour is used to make bread, pudding, pancakes, soup thickener and other foods (Ugwu and Nwoke, 2011). Based on the available information on the nutrients profile of soybean including the amino profiles, human consumption of soybean flour can be promoted because

of its positive effect on nutritional enhancement on different fortified food products (Adelakun *et al.*, 2013). The soybean hull is considered a source of dietary fiber and iron but because it contains some anti-nutritional compounds, its use in flour processing, for example, is limited (Ariela *et al.*, 2013).

Studies have indicated that soybean seeds can be used in the management of diseases like obesity and diabetes owing to their content in bioactive substance or anti-nutrients such as alpha-amylase and alpha-glucosidase inhibitors, protease inhibitors, hemagglutinin and crude fibres, capable of disturbing the normal metabolism and helping in the management of obesity and other metabolic dysfunctions (Robbani *et al.*, 2022). Also, the presence in soybean seeds of phenolic compounds and mainly isoflavones, make them to be more efficient against metabolic diseases and their complications (Cerile *et al.*, 2017). Consuming soy products may lower the risk of type 2 diabetes due to their low glycemic index (Adelakun *et al.*, 2013). According to a meta-analysis, soy protein is linked to significant reductions in blood cholesterol, low-density lipoprotein (LDL) cholesterol, and triglyceride levels. There is increasing evidence that the consumption of soybean products reduces cancer, blood serum cholesterol, osteoporosis, chronic renal disease, heart disease, oxidative stress, and others. The health benefits of soybean products have induced an increase in the demand for the beans (Ntso *et al.*, 2017)

The use of different processing methods to enhance the nutrient content of foods, such as fermentation may be used to detoxify and improve the nutrient availability in some food products (Ikegwu *et al.*, 2021). These effects emphasize that an integrated approach that combines a variety of the indigenous/traditional food processing and preparation practices, including the addition of even a small amount of animal-source foods, is probably the best strategy to improve the content and bioavailability of micronutrients in plant-based diets in resource-poor settings (Ikegwu *et al.*, 2021) This study therefore aim to explore the impact of different processing methods on phytochemical and anti-nutritional composition of soybean flour.

### **Nutritional Composition of Soybean Flour**

Soybean seed contains about 40% protein, 30% carbohydrate, 20% oil and 10% minerals, and B vitamins for human nutrition (Nwodo and Okoye, 2023). Because it contains high amount of protein and oil, the soybean was considered one of the five sacred grains along with rice, wheat, barley and millet (Adelakun

*et al.*, 2013). The protein and oil component of soybean are not only high in terms of quantity but also in quality. For instance, soy oil has a highest proportion of unsaturated fatty acids such as linoleic making it a healthy oil to use. Soybeans are known to be typical of such crops that contain all three of the macro-nutrients required particularly for human nutrition (Adelakun *et al.*, 2013).

The bean is said to have more protein than beef, more calcium than milk and more of a fatty substance called lecithin than eggs (Ugwu and Nwoke, 2011). It contains protein which provides all the essential amino acids in the amounts needed for human health. Most of the essential amino acid present in soybean is available in an amount that is close to those required by humans. It contains moderate quantities of lysine, tryptophan and threonine and can therefore form a good supplement to cereals since they provide adequate amount of lysine for growth and maintenance (Ikegwu *et al.*, 2021). It is also a rich source of polyunsaturated fatty acids (including the Omega-3-fatty acids) which is free from cholesterol (Nwodo and Okoye, 2023).

In addition, soybean flour is rich in vitamins, minerals and acids. These acids can also be called biological active substances or anti-nutritional factors and examples are lipoxigenase, trypsin inhibitors, phytic acids and haemagglutinin (Ugwu and Nwoke, 2011). Additionally, soybean contains phytochemicals which have been shown to offer unique health benefit. It contains isoflavones, which are necessary for the heart, kidneys, colon, liver, and stomach for normal functioning (Kunatsa *et al.*, 2020). Soybean contains the most protein and isoflavones of any leguminous plant, which may help to prevent protein deficiency as well as cancer and osteoporosis (Robbani *et al.*, 2022)

### **Phytochemical Composition**

Phytochemicals are bioactive compounds found in plants. These phytochemicals are potentially important modulators of oxidative stress and have been linked to health beneficial effects. In foods, phytochemicals impart colors, tastes, aromas and other characteristics (Bruyne and Pinna, 2014). They give hot peppers their burning sensation, garlic and onions their pungent flavor, chocolate its bitter tang, and tomatoes their dark red color. In the body, phytochemicals can have profound physiological effects (Bruyne and Pinna (2014). Dietary phytochemicals, including polyphenols, sulfur-containing compounds, terpenoids, polysaccharides, saponins, pigments, and phytohaemagglutinins, have antioxidant, anti-inflammatory, antiviral, and

cancer-preventive or therapeutic properties (Luo *et al.*, 2023). Upon entering the body, these compounds pass through the stomach, liver, small intestine, and colon in that order (Luo *et al.*, 2023). They can act as antioxidants, kicking hormones, stimulating or inhibiting enzymes, interfering with DNA replication, destroying bacteria, and binding physically to cell walls. Any of these actions may suppress the development of diseases, depending in part on how genetic factors interact with the phytochemicals (Bruyne and Pinna, 2014).

Soybeans contain many bioactive minor components that are lipids, proteins, or carbohydrate in nature or low-molecular weight phenolics. Phytochemicals are often found in soybean whole grains, vegetables and also fruits. Examples of common phytochemicals in soybean flour include;

- i. Flavonoids
- ii. Tocopherols
- iii. Anthocyanins
- iv. Phenolic acids
- v. Phytoestrogens (such as isoflavones) (Bruyne and Pinna, 2014).

### **Isoflavones**

Isoflavones are a subclass of a large group called flavonoids (Martino *et al.*, 2021). Isoflavones (genistein, daidzein, and glycitein) are bioactive compounds with mildly estrogenic properties and often referred to as phytoestrogen (Zaheer and Humayoun, 2017). Due to the estrogenic activity, are known as phytoestrogens.<sup>16</sup> They are present in significant quantities (up to 4-5 mg·g<sup>-1</sup> on dry basis) in legumes mainly soybeans, green beans, mung beans (Zaheer and Humayoun, 2017).

Isoflavones present in soy may have risk and benefits to human health. Owing to the pharmaceutical and nutraceutical properties allied with isoflavonoids and their use in functional foods, there is a growing interest in these compounds (Chadha *et al.*, 2017). Soy isoflavones are bioactive molecules, which have been hypothesized to have the ability to protect against coronary vascular disease (Chadha *et al.*, 2017) Soy isoflavones show various health benefits, such as antioxidant and estrogenic effects (Kim *et al.*, 2022)

In soybean, there are basically three types of isoflavones that are normally present in four different isoforms (Zaheer and Humayoun, 2017):

- i. Glucosides (daidzein, genistein and glycytin)



- ii. Acetylglucosides (acetyl daidzin, acetylgenistin and acetacetylglycit)
- iii. Malonylglucosides (malonyl dadzin, malonylgenistin and malonylglycitin)
- iv. Structure unconjugated aglycone (daidzein, genistein and glycitein)

Soybean is the main source of isoflavones (genistein, daidzein and glycitein), and its concentration range from 1.45 to 4.59 mg/g (Martino *et al.*, 2021). Non-fermented products such as dried beans, aqueous extracts of soybeans, soy flour and tofu, contain high concentrations of the glucosides, genistein and daidzein (Martino *et al.*, 2021). Absorption of isoflavones is likely to occur in the small intestine where there is a diverse range of microfloral species able to hydrolyze conjugated isoflavones, releasing the bioactive aglycone for absorption or further metabolism and re-conjugation (Turner *et al.*, 2003).

### Phenolic Acids

The possible effects of phenolic acids in the body include triggering of enzyme production to make carcinogenic water soluble and also facilitating excretion (Kunatsa *et al.*, 2020).

### Anti-Nutritional Factors (ANFs) in soybeans

Antinutritional factors (ANFs) are defined as biological components present in foods that can reduce nutrient utilization or food uptake, which leads to impaired gastrointestinal functions and metabolic performance (Geetha, 2020). The assimilation of nutrients is negatively influenced by these antinutrients. These antinutrients also interfere with the metabolism of other nutrients like protein, calcium, iron, and micronutrients such as iodine and zinc, etc (Geetha, 2020). Anti-nutrients are natural or synthetic compounds, whose action within the human body reduce the bioavailability and/or utilization of nutrients if consumed in large quantities and over a long period of time (Kunatsa *et al.*, 2020). Legumes are rich and low-cost sources of dietary proteins and nutrients for a large part of the World's population, but their nutritive value is limited by the presence of several anti-nutritional and toxic substances (Egounlety and Awoh, 2003).

A key problem associated with utilization and processing of soybean is the presence of certain anti-nutritional factors which may inhibit the availability of the desired nutrients such as protein and minerals (Ugwu and Nwoke, 2011). Soybean contain anti-nutritional factors, which are known to exert deleterious



effects in man and animals when ingested. These interfere with digestive processes and prevent efficient utilization of the legume proteins. These toxic factors may occur in all parts of the plant, but the seed is normally the most concentrated source (Ikegwu *et al.*, 2021).

Although soybean has good nutritional and bioactive properties, it, on the other hand, also contains a significant amount of antinutrients like gums, trypsin inhibitors, oxalate, phytates, saponins, and tannins which reduce the bioavailability of some nutrients thus becoming detrimental to health (Egounlety and Awoh, 2003). Soybean contains several inhibitors of proteases, lectins and enzymes (such as lipoxygenase and urease) (Martino *et al.*, 2021). Some of the prominent anti-nutritional factors in soybean include trypsin inhibitors, hemagglutinin, phytic acid, goitrogen, urease activity and flatulence causing factors (Stachyose and raffinose) (Ugwu and Nwoke, 2011). Additionally, lipoxygenases catalyse lipid hydroperoxidation leading to the so-called beany flavor thus limiting the consumption of soybean products. Whole soybean contains about 7-9% of protease inhibitors that are in the grain cotyledon. Although cultivars without protease inhibitors already exist (Martino *et al.*, 2021).

In addition to trypsin inhibitors, several other anti-nutritional and/or allergenic compounds associated with carbohydrate fraction exist in soybean glycinin, beta-conglucinin, oligosaccharides, lectins and Saponins (Ugwu and Nwoke, 2011). Some specific types of carbohydrates in soybean meal can impart a beany taste and influence its palatability. One of the most important factors inhibiting the acceptance of soybean and products is the “beany” flavor problem. This flavor is hardly evident in the raw whole beans but develops after the breakdown of the cell structure and is still evident after cooking (Ugwu and Nwoke, 2011). Some of these compounds, oxalate and phytic acid included, directly chelating nutrients (minerals and proteins), making them unavailable for absorption (Kunatsa *et al.*, 2020).

Primarily, raffinose, stachyose and verbascose present in most legume seeds are linked to flatulence. Researchers have suggested practical procedures for the reduction of flatulence in cooked and processed soybeans. To increase the consumption of whole soybean, different types of heat-treatment have been used in grains to inactivate or reduce the activity of anti-nutritional compounds (Adelakun *et al.*, 2013). These include fermentation, removal of seed coat prior

to cooking or processing, soaking in water, germination and cooking with a mixture of sodium carbonate and bicarbonate. Oligosaccharides can also be reduced through fermentation thereby leading to elimination of flatulence (Adelakun *et al.*, 2013).

### **Saponins**

Saponins are generally considered antinutritional factors even though they may exert some health beneficial effects in the body. Saponins, naturally occurring as glycosides, can interfere with nutrient absorption and utilization thus potentially leading to impaired gastrointestinal functions and reduced metabolic performance. Saponins are naturally occurring structurally and functionally diverse phytochemicals that are widely distributed in plants (Moses *et al.*, 2014). They are a complex and chemically varied group of compounds consisting of triterpenoid or steroidal aglycones linked to oligosaccharide moieties. They are characterized by their unique structure consisting of a hydrophobic aglycone (steroid or triterpenoid) linked to hydrophilic sugar molecules, giving them foaming properties and a wide range of potential biological activities like anti-inflammatory, cholesterol-lowering, and antimicrobial effects; essentially acting like a “natural soap” within plants (Moses *et al.*, 2014).

Saponins are water-soluble glycosides with a bitter taste. They reduce the uptake of cholesterol, and hence prevent cardiovascular diseases (Geetha, 2020). Saponins may have plasma cholesterol lowering effect in humans and are important in reducing the risk of many chronic diseases (Pirjo *et al.*, 2018). They are a diverse group of plant secondary metabolites with a wide array of activities, as well as a significant role in nutrition and health. Soy saponins are a special group of saponins. These represent the main source of saponins in *Glycine max* (soybeans, Fabaceae) (Tantry and Khan, 2013).

### **Phytates**

The phytic acid, also known as phytate, inositol hexaphosphate (IP6), myo-inositol, myo-inositol and inositolphosphate, is the main form of phosphorus stocks in soybean which is essential for germination of the grain (Martino *et al.*, 2021). The chemical name of phytic acid is myo-inositol-1,2,3,4,5,6-hexakisphosphoric acid. Phytate reduces the absorption of vitamin D, calcium, zinc, and iron in the intestine (Geetha, 2020). Some myo-inositol phosphates have been reported to have the potential to prevent renal stone formation and

atherosclerosis and may also minimize the risk of colon cancer. Myo-inositols with fewer than six phosphate residues have the potential to prevent diabetes complications (Geetha, 2020). Phytic acid can decrease the bioavailability of proteins by binding to peptides and amino acids thereby inhibiting proteolytic enzyme action (Ariela *et al.*, 2013). The use of a combination of processing methods can almost completely remove phytate. This is important because phytic acid is a potent inhibitor of iron absorption, even at low concentrations (Ikegwu *et al.*, 2021).

### **Oxalates**

The majority of species in the Leguminosae family contain oxalate in one or more of their tissues. The greater concentrations of oxalate in soybean are found in the mature seeds (Martino *et al.*, 2021). The oxalate content of some plants is known to vary by genotype of soybean and possibly within cultivars under different growth conditions (Martino *et al.*, 2021). Some absorbed oxalate cannot be metabolized by humans and is excreted in the urine. In humans, high urinary oxalate increases the risk of calcium oxalate (CaOx) kidney stones because CaOx is poorly soluble in the urine. Saturated oxalate in solution binds to Ca to form crystals that aggregate, often becoming large enough to block the urinary stream (Martino *et al.*, 2021). Oxalic acid and its salts are also harmful to the body because they interfere with calcium absorption, leading to the formation of kidney stones (Geetha, 2020).

### **Trypsin Inhibitors**

There are two types of inhibitors: the Kunitz trypsin (KTI), and chymotrypsin Browman-Birk (BBI) (Martino *et al.*, 2021). Trypsin inhibitors prevent the digestion of protein in the body, which leads to the buildup of indigestible compounds in body (Geetha, 2020). The significance of soybean trypsin inhibitors (TI) lies in their implication in inhibiting the pancreatic enzymes (trypsin and chymotrypsin) resulting in reduction in protein digestibility both in humans and animals (Ugwu and Nwoke, 2011). Efforts have been made to inactivate or remove trypsin inhibitors from soybean, and it is reported that many approaches had been based largely on heat treatment (Ugwu and Nwoke, 2011).

## **Materials and Method**

### **Procurement of raw Materials**

Soybeans were purchased from Bodija market in Ibadan, Nigeria.

**Ethical approval:** The ethical approval for this study was obtained from the Lead City University Ethical Review Board with the approval number LCU-REC/25/0013

### Processing of soybean into soybean flour

Soybean was cleaned and sorted manually to remove extraneous matters, dirt and bad seeds. The clean soybeans were then processed into flour thus:

- i. **RWSB:** raw soybean that the seed coat was removed and milled into flour to serve as the Control sample
- ii. **ROSB:** Soybean was roasted in pan with constant stirring, cooled, peeled and milled into flour
- iii. **SRSB:** Soybean was washed, soaked in water for 16 hours, rinsed, peeled, oven dried, roasted and milled into flour.
- iv. **SBSB:** Soybean was washed, soaked in water for 16 hours, rinsed, boiled in water for 10 minutes, peeled, oven dried and milled into flour.

These four samples were subjected to proximate, phytochemical and antinutrients composition analyses using standard methods.

### Determination of proximate, phytochemicals and antinutrients composition of the samples

Proximate, phytochemicals and antinutrients composition were determined using A.O.A.C (2005) method.

**Statistical analysis:** Descriptive statistics were used to express the data while Analysis of Variance was used to compare the mean values ( $p < 0.05$ )

### Result and Discussion

Table 1: Proximate composition of the processed soybean flour samples

Samples	Moisture content	Crude Protein	Fat	Ash	Crude fiber	Carbohydrate
RWSB (Control)	3.93±0.15	31.98±0.05	8.35±0.01	4.62±0.01	6.56±0.01	44.56±0.15
ROSB	4.37±0.15	31.93±0.05	8.33±0.02	4.62±0.02	6.55±0.02	44.20±0.12
SRSB	5.57**±0.12	30.76±0.05	6.19*±0.57	4.45±0.01	6.31±0.01	46.39**±0.14
SBSB	4.83**±0.58	24.40*±0.05	5.17*±0.01	3.53*±0.01	5.01*±0.03	57.07**±0.51

\*-Mean data significantly lower than the control ( $p < 0.05$ )

\*\* -Mean data significantly higher than the control ( $p < 0.05$ )

RWSB- Raw soybean flour

ROSB- Roasted soybean flour

SRSB- Soaked and roasted soybean flour

SBSB- Soaked and boiled soybean flour

Table 1 shows the proximate composition of the soybean flours. Raw soybean flour contained the highest protein, fat, ash and crude fiber while the roasted soybean flour did not significantly differ from the raw sample (control) in these parameters. This shows that roasting of soybean maximally preserved the protein, fat, ash and crude fiber composition of the flour. SRSB which was the soaked and roasted sample did not significantly differ from the control in protein, ash and fiber composition thus showing that soaking and roasting also preserved the protein, ash and fiber composition appreciably or notably. This was different from the report of Ogbemudia *et al.*, 2017 who reported a proximate composition of raw soybean flour thus: protein-37.69%, crude fat-28.20%, ash-4.29%, moisture-8.07%, fiber-5.44% and carbohydrate-16.31%. This disparity may be as a result of different varieties of soybean used. On the other hand, Chuahan et al., 2022 reported an 11.84% and 22.13% increase in the protein content of soybeans after germination and fermentation respectively. Furthermore, moisture, ash, fat, fiber and crude protein content of raw soybean was reported to be 5.3%, 7.3%, 22.7%, 7.5% and 36.6% respectively and these parameters were observed to be 6.7%, 6.0%, 2.7%, 4.5% and 48.9% in solvent extracted soybean and 4.4%, 4.4%, 22.0 %, 5.4% and 37.6% in extruded full-fat soybean (Siulapwa and Mwambungu (2014). In this study roasting, soaking and roasting and soaking and boiling reduced the protein content of soybean by 0.16%, 3.82% and 23.70% respectively and this is not comparable to the results of Agarwal, 2014 who observed a 2.72% and 6.19% increase in protein content of soybeans after pressure cooking and soaking but observed a 17.20% reduction in protein content after roasting.

**Table 2:** Phytochemical composition of the processed soybean flour samples (mg/g)

Samples	Total Phenolics	Phytosterols	Flavonoids
RWSB(Control)	0.215±0.001	0.700±0.004	0.805±0.030
ROSB	0.183*±0.001	0.526*±0.012	0.328*±0.010
SRSB	0.182*±0.002	0.141*±0.004	0.788±0.003
SBSB	0.187*±0.001	0.114*±0.003	0.425*±0.030

\*-Mean data significantly lower than the control

RWSB- Raw soybean flour

ROSB- Roasted soybean flour

SRSB- Soaked and roasted soybean flour  
 SBSB- Soaked and boiled soybean flour

The three methods of processing preserved the total phenolics in the soybean flour in a similar fashion because there was no significant difference in this parameter in the processed samples. Roasting alone (ROSB) maximally preserved the phytosterols composition while soaking and roasting (SRSB) maximally preserved the flavonoids composition. There was no significant difference between the flavonoids composition of the control and SRSB (soaked and roasted sample). The phytochemical composition of soybean flour in this study is in disparity with the report of Robbani *et al*, 2022 who reported a phenolic content of 25.25 mg/g in raw soybean flour in methanolic extract, 18.20mg/g in methanolic/aqueous extract and a flavonoids content of 98.72mg/g in methanolic extract while methanolic aqueous extract was observed to contain 18.31mg/g of flavonoids. This disparity may be as a result of different varieties of soybean used and the differences in agro-ecological factors where the soybeans were grown. In the same vein, Thakur *et al.*, 2022 reported a Total Phenolic content of raw, soaked and roasted soybean flours as 14.35, 14.64 and 17.20 mgGAE/100g respectively which are quite different from the values observed in this study. Phenolic content or compounds exert numerous health benefits owing to their antioxidant and anti-inflammatory properties and ability to combat oxidative stress and can prevent various non-communicable diseases such as cancer, cardiovascular diseases, hypertension, arthritis as well as improve gut health, enhance immune function and reduce allergy symptoms (Sun and Shahrajabian, 2023). The processing methods employed in this study significantly reduced the total phenolic content of soybeans and in similar fashion since the total phenolic content of the three processed samples were not significantly different (Table 2). Results from this study shows that soybean flour that was produced from soaked and roasted soybeans will exert more health benefits since it contained the highest total phenolic content and flavonoids.

However, roasting alone maximally preserved the phytosterol composition of the soybean flours and soaking and roasting least preserved it. Phytosterols have cholesterol-lowering, anti-inflammatory and anti-oxidant properties. They can help to reduce Low Density Lipoproteins cholesterol levels which is beneficial for cardiovascular health and may also contribute to the prevention of certain types of cancer.

However, the report of Chuahan *et al.*, 2022 was in contrast with what was observed in this study because they reported an increase of 11.49%, 8.96% and 2.95% in the phenolic content of germinated, fermented and roasted black soybean respectively. The flavonoids content of different soybean varieties was reported to range from 0.25 to 0.81mg/g as observed by Getaneh-Zewudie and Gemedie, 2024 and this was similar to the values obtained from raw soybean in this study, however, the total phenolic content observed by them was in contrast with the values obtained from this study. They reported a total phenolic content of 1.19 to 2.20mg/g in different soybean varieties.

**Table 3:** Antinutrients composition of the Processed Soybean flour Samples

Samples	Tannin (mg/g)	Trypsin Inhibitor (TIU/g)	Phytate (mg/g)	Saponin (mg/g)
RWSB (Control)	0.660±0.031	1.562±0.009	0.151±0.008	2.093±0.038
ROSB	0.538*±0.045	1.172*±0.027	0.142*±0.001	1.587*±0.040
SRSB	0.273*±0.001	0.254*±0.010	0.098*±0.002	1.040*±0.056
SBSB	0.372*±0.001	0.315*±0.009	0.119*±0.001	1.603*±0.057

\*-Mean data significantly lower than the control

RWSB- Raw soybean flour

ROSB- Roasted soybean flour

SRSB- Soaked and roasted soybean flour

SBSB- Soaked and boiled soybean flour

Table 3 shows the antinutrients composition of the processed soybean flour samples. All the processing methods significantly reduced the antinutrients composition but soaking and roasting (SRSB) was most effective in reducing the antinutrients maximally (Table 2). The least values for the antinutrients content were observed in soaked and roasted soybean flour (SRSB) showing that it will enhance bioavailability of nutrients the most compared with the roasted (ROSB) and soaked and boiled (SBSB) samples (Table 3). The report of Getaneh-Zewudie and Gemedie, 2014 was in contrast with the values observed in this study because they reported the phytate, oxalate and tannin content of raw soybean varieties to range from 1.99 to 2.72 mg/g, 15.80 to 20.20mg/g and 13.49 to 19.16mg/g respectively. This variation could be as a result of differences in agro ecological factors under which the soybeans were produced. Furthermore, Siulapwa and Mwambungu, 2014 reported the trypsin inhibitor content of raw, solvent extracted and extruded full-fat soybean to be 54.0, 10.0 and 1.0mg inhibited trypsin/g respectively. This was in contrast with the values observed in the raw soybean in this study and may be as a result of the different soybean



varieties used. Germination, fermentation and roasting reduced phytic acid in soybeans by 34.04, 51.06 and 13.47% respectively while tannin was reduced by 47.22, 75.00 and 38.89% respectively (Chuah *et al.*, 2022). On the other hand, Agarwal, 2014 reported the phytate content of raw, roasted, pressure cooked and soaked soybean as 16.03, 1.86, 7.23, and 7.23 mg/g showing a reduction of 88.65, 54.90 and 54.90% respectively while the trypsin inhibitor content was 114.16, 61.40, 38.70 and 79.8mg/100g showing a reduction of 46.21, 66.10 and 30.09% respectively. In this study roasting reduced phytate, tannin, trypsin inhibitor and saponin content of raw soybeans by 5.96, 18.49, 24.97 and 24.18% respectively (Table 3).

### Conclusion and Recommendation

The optimal culinary processing method for the production of soybean flour is soaking and roasting since it preserved the nutritional and phytochemical composition notable while concomitantly reduced the antinutritional factors markedly. Production of soybean flour by soaking and roasting is hereby recommended for its culinary application.

Soybean flour can be applied in the preparation of the following:

- I. **Soymilk:** Soybean flour can be reconstituted with water, heated to simmering point and allowed to simmer for 1 to 2 minutes and sieved to extract the milk which can be sweetened as desired.
- ii. **Soy cheese:** Soymilk can be curdled into cheese with bomb om leaf extract, lime juice or water decanted from fermented maize slurry (ogi). This can then be seasoned, fried, sauteed or put in soups, stews and sauces and be an accompaniment to staples such as rice, yam, potato, etc.
- iii. **Composite flours:** Soybean flour can be used to fortify carbohydrate dense staple flours such as wheat, sorghum, cassava, etc which can be applied in confectioneries, baking of cookies, pastries, spaghetti and other pastas.
- iv. **Complementary foods:** Soybean flour can be combined with carbohydrate dense staples such as maize, sorghum, plantain, oats, etc in the preparation or production of complementary foods for infants.
- v. **Soups and sauces:** soybean flour can be used directly in soups and sauces.



It is also recommended that the following policies are put in place at different government levels in African countries:

- i. Subsidizing the agricultural inputs in the growing and production of soybean.
- ii. Giving soybean farmers land, credit and loan facilities.
- iii. Encourage small and medium scale enterprises to engage in soybean processing.
- iv. Public awareness via various media channels on the nutritional and health benefits of consuming soybean products.

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CHAPTER 12

# FORMULATION AND NUTRITIONAL EVALUATION OF AFFORDABLE COMPLEMENTARY FOODS FROM LOCAL INGREDIENTS: A STRATEGY FOR COMBATING CHILD MALNUTRITION IN LOW-INCOME COMMUNITIES

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## Abstract

**M**alnutrition among infants and young children remains a major public health concern in low-income countries, particularly in sub-Saharan Africa. Many families lack access to affordable, nutrient-rich complementary foods during the critical weaning period. This study developed and evaluated four locally formulated rice-based complementary food blends using combinations of white rice, soybean, crayfish, groundnut, tiger nut, and dates. A commercial complementary food served as the control. The objective was to assess and compare the nutritional composition and sensory acceptability of the local formulations to the commercial product, with implications for food security and poverty alleviation. The blends (FR<sub>1</sub>–FR<sub>4</sub>) were analyzed for proximate composition, mineral content, and organoleptic qualities using standard laboratory and sensory evaluation procedures. FR<sub>1</sub> contained 70% white rice, 20% soybean, 5% crayfish, and 5% dates. FR<sub>2</sub> used

*groundnut in place of crayfish, FR<sub>3</sub> included tiger nut, and FR<sub>4</sub> incorporated a combination of all ingredients in varied proportions. Results showed that all local blends had significantly higher protein, fat, and mineral contents than the commercial control (FR<sub>5</sub>). Sensory evaluation revealed that FR<sub>1</sub> and FR<sub>4</sub> were the most preferred among the locally made blends, comparable to the commercial product. These findings demonstrate the potential of locally sourced, affordable ingredients to produce nutritious and acceptable complementary foods. This study supports community-level nutrition interventions and small-scale food processing initiatives as strategies to address malnutrition, improve maternal empowerment, and promote sustainable public health outcomes.*

**Keywords:** *complementary foods, malnutrition, local ingredients, food security, infant nutrition, poverty alleviation, sensory evaluation.*

## **Introduction**

Malnutrition is a persistent and widespread public health challenge in sub-Saharan Africa (Adedoyin et al., 2022). It affects millions of children and undermines their chances of survival, growth, and development. Among the most vulnerable age groups are infants and young children between 6 and 24 months, during which the need for adequate nutrition is at its highest. This period marks the transition from exclusive breastfeeding to complementary feeding, which is essential to meet a child's increasing energy and nutrient requirements (World Health Organization [WHO], 2023).

During this transition, the quality of complementary foods plays a critical role in determining a child's health outcome. Unfortunately, in many low-income and rural households, these foods are often nutritionally inadequate (Kamudoni et al., 2024). The situation is worse in poor communities where families struggle to afford diverse and nutrient-rich diets. Instead, they rely on cheap, starchy foods like thin maize or rice porridge, which may fill the stomach but do not provide the protein, fat, vitamins, and minerals that children need (Erokhin et al., 2021).

Poverty is one of the leading causes of child malnutrition. Poor families often lack the financial means to purchase animal protein, fruits, vegetables, and other nutrient-rich foods. This economic limitation forces households to depend on monotonous diets that are high in carbohydrates but low in essential nutrients (Darmon & Drewnowski, 2015). As a result, children in such environments suffer from hidden hunger, a form of malnutrition caused by micronutrient deficiencies that are not immediately visible but have serious long-term consequences. Additionally, poverty limits access to health services, clean water, and proper sanitation. This increases the risk of infections such as diarrhea, which in turn reduces nutrient absorption and leads to growth faltering (Mshida et al., 2018). In low-income communities, mothers may also have limited education and knowledge of nutrition, making it challenging for them to make informed feeding decisions. Studies have shown that maternal education is strongly associated with improved child nutrition outcomes (Rezaeizadeh et al., 2024).

Furthermore, poverty affects food availability and accessibility. In many rural areas, markets may be far away, and transportation costs are high. Families may not have the resources to grow diverse crops or raise livestock (Kaiser & Barstow, 2022). Even when local ingredients are available, the knowledge or tools to process and combine them into balanced meals may be lacking (Open Resources for Nursing, 2021). The situation is especially critical during the 6–24-month window, which is often referred to as the “window of opportunity” for preventing malnutrition and promoting optimal growth (Roberts & Stein, 2017). Poor complementary feeding practices during this time can lead to irreversible damage, including stunting, weakened immunity, and reduced cognitive ability (Cheikh Ismail et al., 2022).

To address this problem, locally sourced, affordable, complementary foods offer a promising and sustainable solution. Several indigenous ingredients such as white rice, soybeans, tiger nuts, groundnuts, crayfish, and dates are available in many parts of Africa (Ogunniran et al., 2024). These ingredients are rich in carbohydrates, proteins, fats, and micronutrients, making them suitable for blending into nutrient-dense complementary foods (Ogunniran et al., 2024). Studies have shown that combining cereals with legumes, nuts, and animal-source foods can significantly enhance the nutritional value of infant foods (Anwar et al., 2024; Abubakar & Zigla, 2021). Using local crops also supports



agricultural development and reduces dependence on expensive, imported baby foods, which are unaffordable for poor households (Tadesse et al., 2024).

Moreover, empowering caregivers, especially mothers, with the knowledge and tools to prepare these foods at home can contribute to poverty reduction, women's economic empowerment, and community nutrition education (Heckert et al., 2019). These strategies align with the broader goals of sustainable development, particularly in improving good health, promoting agricultural productivity, and addressing poverty and rural underdevelopment. This chapter seeks to contribute to the knowledge on sustainable child nutrition by evaluating the nutritional composition of a complementary food formulated from white rice, soybeans, tiger nuts, groundnuts, crayfish, and dates. The choice of these ingredients is based on their local availability, affordability, and nutritional potential. The formulation will be analyzed for energy, protein, fat, carbohydrates, and micronutrient content. The ultimate goal is to demonstrate how locally produced, nutrient-rich food blends can be a practical strategy for reducing child malnutrition in poor communities, thereby contributing to poverty alleviation and sustainable development in Africa.

### **Statement of the Problem**

Despite the availability of local, nutrient-rich crops in many African communities, child malnutrition remains a persistent problem (Quamme & Iversen, 2022). One of the main challenges is the lack of affordable and nutritionally balanced complementary foods for children between 6 and 24 months of age (Quamme & Iversen, 2022). During this critical growth stage, poor households often rely on monotonous, starchy foods that do not meet the nutritional needs of young children (Omachi et al., 2022). Commercially produced complementary foods are either unavailable in rural areas or too expensive for low-income families. As a result, caregivers are left with few options for feeding their children appropriately (Omachi et al., 2022). Even where local ingredients are available, there is limited knowledge on how to combine them into balanced, safe, and age-appropriate meals (Open Resources for Nursing, 2021). This gap in affordable, home-based food solutions contributes to high rates of stunting, wasting, and micronutrient deficiencies among children. The lack of practical, low-cost, and culturally acceptable alternatives continues to limit progress in reducing child malnutrition and food insecurity (Durao et al., 2020). Therefore, there is an urgent need to formulate

and evaluate complementary foods using local ingredients that are both affordable and nutritionally adequate. By doing so, we can offer a practical strategy for improving child health and breaking the cycle of poverty in resource-poor settings.

### **Significance of the Study**

The first two years of life are essential for physical growth, brain development, and long-term health (Balasundaram & Avulakunta, 2023). Without access to adequate nutrition during this period, children are at risk of stunted growth, weakened immunity, delayed cognitive development, and even death (Quamme & Iversen, 2022). In many African communities, poverty limits the ability of families to purchase commercial complementary foods, which are often expensive and not locally available (Walls et al., 2023). At the same time, there is a wealth of local food resources that remain underutilized. This study explores how affordable, locally available ingredients; white rice, soybeans, tiger nuts, groundnuts, crayfish, and dates can be combined to formulate a nutrient-rich complementary food blend. With this, this study provides a practical solution that communities can adopt using resources they already have.

The findings from this study will be valuable to several groups. First, caregivers and mothers in poor households will benefit from practical knowledge on how to prepare affordable and nutritious meals for their children using familiar ingredients. This empowers them to improve household nutrition with minimal financial burden. Second, nutritionists, public health workers, and development practitioners will gain evidence-based insights to support nutrition education and community-based interventions. Third, policy makers and government agencies may use the results to guide national policies that promote the use of indigenous foods in child feeding programs.

The originality of this study lies in its focus on a cost-effective, home-based solution to a public health problem that is often addressed with expensive, imported interventions. It contributes to local knowledge on food formulation and supports the goal of nutrition-sensitive agriculture. The study also aligns with the Sustainable Development Goals (SDGs), particularly those targeting zero hunger, good health and well-being, and poverty reduction (Atukuda et al., 2021).

### **Research Objectives**

The specific objectives of this study are to:

- i. Formulate complementary food blends using locally available and affordable ingredients.
- ii. Determine the proximate composition of the formulated complementary food blends.
- iii. Evaluate the sensory properties of the formulated complementary food through a panel-based sensory assessment.
- iv. Compare the sensory characteristics of the formulated complementary food with those of a commercially available infant complementary food.
- v. Compare the nutrient composition of the formulated complementary food with that of the selected commercial infant food product, to assess its nutritional adequacy.

### **Literature Review**

Complementary feeding is a crucial phase in a child's growth and development. It begins at around six months of age, when breast milk alone can no longer meet the infant's energy and nutrient needs. According to the World Health Organization (WHO, 2023), this period is a vital window of opportunity to ensure proper growth, prevent malnutrition, and promote long-term health outcomes. The quality and nutritional adequacy of the foods introduced during this stage can significantly affect a child's physical and cognitive development (Roberts et al., 2022). Yet, in many low-income settings, children are fed diets that are monotonous, low in energy density, and deficient in essential nutrients such as protein, iron, zinc, and vitamin A (Roberts & Stein, 2022).

Empirical studies show that poor complementary feeding practices are widespread in many parts of sub-Saharan Africa. Abeshu et al. (2016) highlighted that homemade complementary foods in low-income households are often based on cereal gruels that lack protein, healthy fats, and micronutrients. These foods tend to be bulky, low in nutrient density, and insufficient to meet the dietary needs of growing children. Walle and Haile (2017) emphasized that blending cereal grains with legumes can improve the nutritional quality of complementary foods. Their study formulated a food blend using maize and soybeans and found it rich in essential amino acids, making it suitable for young children. Similarly, Adegbusi et al. (2023)

developed a complementary food mixture of maize, soybeans, and crayfish and observed significant improvements in protein and mineral content.

Adegbanke et al. (2017) conducted a study on sorghum-based complementary foods blended with groundnut and orange-fleshed sweet potatoes. Their results showed that the formulated food had improved levels of beta-carotene (a precursor to vitamin A), protein, and energy, and was well accepted during sensory evaluation. Yu et al. (2022) also demonstrated that tiger nuts are rich in dietary fiber, iron, calcium, and unsaturated fats, suggesting their suitability for incorporation into child-friendly diets. Dates, as shown in the work of Al-Shwyeh (2019), offer high energy due to their natural sugar content and also contribute potassium, magnesium, and antioxidants that support immune function. Groundnuts are known for their high protein and fat content, while crayfish is a good source of calcium, zinc, and high-quality animal protein (Adegbanke et al., 2017).

Despite the availability of such ingredients, poverty remains a major barrier to adequate nutrition for children aged 6 to 24 months. Families in rural or low-income communities often lack the financial means to purchase nutrient-rich foods, let alone commercial infant products, which are typically expensive and imported (Woodhill et al., 2022). Abeshu et al. (2016) reported that children in poor households frequently consume diets composed almost entirely of low-cost staples such as rice or maize, which fill the stomach but do not provide adequate protein or micronutrients. This leads to what is often referred to as “hidden hunger,” where nutrient deficiencies are not outwardly visible but can result in serious developmental delays and health issues (Weffort & Lamounier, 2024).

In many parts of Africa, poor households also face challenges in accessing healthcare, clean water, and sanitation, all of which contribute to the risk of infection and nutrient loss through illnesses such as diarrhea. Mshida et al. (2018) explained that repeated infections reduce a child's ability to absorb nutrients, even when food is available. This creates a vicious cycle of malnutrition and disease, particularly among children who are already vulnerable due to poor diets. Maternal education is another important factor. Rezaeizadeh et al. (2024), mothers with higher education levels are more likely

to adopt improved feeding practices, yet in many rural areas, education levels remain low.

Kitaw et al. (2024), in a recent study in Ethiopia, found that food insecurity, poverty, and low maternal education were significant predictors of poor feeding practices among children aged 6–24 months. The study concluded that interventions must go beyond food provision and focus on empowering caregivers with knowledge and access to affordable, nutrient-dense options that can be prepared using local ingredients. Despite growing interest in food-based solutions to child malnutrition, there are notable research gaps. Most studies tend to focus on a limited range of ingredients, primarily maize, millet, and soybeans. Less attention has been given to combinations involving tiger nuts, dates, or crayfish, ingredients that are affordable, locally available, and nutritionally promising. Furthermore, many studies assess either nutrient composition or sensory attributes but do not evaluate both. Yet, the acceptability of food in terms of taste, texture, and appearance is critical if it is to be adopted in real-world household settings.

Another gap lies in the comparison between locally formulated complementary foods and commercial infant products. Such comparisons are important to determine whether low-cost alternatives can meet or exceed the nutritional standards set by expensive, branded products. In addition, while studies have explored food formulation in academic settings, few have translated these findings into community-based recommendations that can be scaled up for practical use. This chapter seeks to address these gaps by formulating a complementary food using a unique combination of white rice, soybeans, tiger nuts, groundnuts, crayfish, and dates, ingredients that are not only nutritious but widely available in many African regions. It also compares the nutritional and sensory characteristics of the formulation with those of a commercially available infant food.

### **Materials and Methods**

All raw materials used in this study, including white rice, soybeans, tiger nut, groundnut, crayfish, and dates, were sourced from the Bodija Market in Ibadan, Oyo State, Nigeria. A sieve was also procured for use in flour processing. These ingredients were selected based on their nutritional contributions and local availability, ensuring the formulation aligns with both health and cultural acceptability criteria.

The preparation of individual flours was carried out using standardized and slightly modified traditional methods. White rice was processed by first sorting to remove debris and defective grains, followed by dry milling into fine powder and sieving to obtain uniform particle size. Soybean preparation involved cleaning, washing, and perboiling to facilitate husk removal. The husks were manually separated before the soybeans were oven-dried, milled, and sieved to yield a fine flour. Tiger nuts were cleaned, washed, and oven-dried at 260°C for 15 minutes, after which they were ground and sieved to obtain flour. Groundnuts were cleaned, roasted to enhance flavor and reduce moisture content, dehulled, and blended into flour. Crayfish were sorted to eliminate impurities, sun-dried, milled, and sieved to produce a fine protein-rich powder. Dates were dehulled, washed, sun-dried, milled, and sieved, contributing natural sweetness and fiber to the formulation.

Four different composite flour blends were formulated in varying ratios, with one commercial sample (FR5) serving as the control. The specific formulation ratios were as follows:

- i. FR1: 70% white rice, 20% soybean, 5% crayfish, 5% dates
- ii. FR2: 70% white rice, 20% soybean, 5% groundnut, 5% dates
- iii. FR3: 65% white rice, 25% soybean, 5% tiger nut, 5% dates
- iv. FR4: 60% white rice, 20% soybean, 5% tiger nut, 5% groundnut, 5% crayfish, 5% dates
- v. FR5 (Control): Commercial complementary food (Friska) consisting of rice, soybeans, banana, moringa, and dates

Each formulation yielded a total of 500g of flour blend, intended for use as instant complementary cereal.

### **Proximate Composition Analysis**

Standard analytical procedures outlined by the Association of Official Analytical Chemists (AOAC, 2015) were employed to determine the proximate composition of the flour samples. Moisture content, crude protein, crude fat (ether extract), ash, crude fiber, and carbohydrate (by difference) were all quantified. Crude protein was determined using the semi-micro Kjeldahl method, encompassing digestion, distillation, and titration steps. Samples (0.5g) were digested with concentrated H<sub>2</sub>SO<sub>4</sub> and catalyst tablets, cooled, diluted, and steam-distilled. Ammonia liberated during distillation was

trapped in boric acid and titrated against 0.01N HCl. The percentage nitrogen obtained was converted to crude protein by multiplying with a factor of 6.25.

Fat content was determined using Soxhlet extraction. A known mass (1g) of each sample was placed in a fat-free thimble and extracted with petroleum ether (b.p. 40–60°C) for six hours. After ether evaporation, the residue in the flask represented the crude fat, which was quantified gravimetrically. Moisture and dry matter contents were estimated by oven-drying 2g of each sample at 100°C until a constant weight was achieved. Moisture loss represented the water content, while the residue represented dry matter. Ash content was determined by incinerating 2g of each sample in a muffle furnace at 550°C for 4 hours. The remaining inorganic residue was expressed as a percentage of the original sample weight. Crude fiber was determined through acid and alkaline digestion using 0.25N  $H_2SO_4$  and 0.313N NaOH, respectively. After refluxing, the residue was washed, dried, weighed, and incinerated at 550°C to obtain fiber content by difference in mass. Carbohydrate was computed by subtracting the total percentage of moisture, protein, fat, fiber, and ash from 100%.

### **Mineral Analysis**

Mineral content analysis included macrominerals, calcium, potassium, and sodium, quantified using a flame photometer. Ash residues were digested in 2M HCl, filtered, and analyzed with the appropriate filters for each element. Results were expressed in percentage concentration using calibrated standards. Micronutrient elements iron (Fe) and zinc (Zn) were determined using Atomic Absorption Spectrophotometry (BUCK 200 AAS). Samples were aspirated into the spectrophotometer and measured at element-specific wavelengths using respective hollow cathode lamps and appropriate fuel-oxidant combinations.

### **Sensory Evaluation**

Sensory evaluation was conducted among a panel of ten nursing mothers residing in the Felele community, Ibadan, each having infants aged between 6 and 24 months. The mothers evaluated the samples for appearance, aroma, colour, taste, and texture using a nine-point hedonic scale. While children performed the tasting, mothers also evaluated the samples to provide documented responses. This participatory method helped ensure practical acceptability of the complementary food in the target demographic.



### Statistical Analysis

All analyses were conducted in triplicate, and data were expressed as mean  $\pm$  standard deviation. One-way analysis of variance (ANOVA) was performed using SPSS version 26.0 to determine the statistical significance of differences between formulations and the control. A p-value less than 0.05 ( $P < 0.05$ ) was considered statistically significant.

### Ethical Consideration

Ethical clearance for the study was obtained from the Ethical Committee of Lead City University, Ibadan, Oyo State (LCU- REC/24/086). Participation in the sensory evaluation was voluntary, and informed consent was obtained from all respondents.

### Results

#### Proximate Composition of the Samples

Table 1 presents the proximate composition of the formulated food samples (FR1–FR5). Crude fibre content varied among the samples, with the highest recorded in the control sample (FR5) at  $3.87 \pm 0.00\%$ , while the lowest was observed in FR4 ( $0.54 \pm 0.21\%$ ). Intermediate fibre values were noted in FR1 ( $0.57 \pm 0.01\%$ ), FR2 ( $0.68 \pm 0.02\%$ ), and FR3 ( $0.72 \pm 0.01\%$ ). The crude protein content across samples ranged from  $17.34 \pm 0.08\%$  (FR3) to  $19.98 \pm 0.00\%$  (FR5). FR4 recorded  $18.43 \pm 0.08\%$ , which was slightly higher than FR1 ( $18.24 \pm 0.08\%$ ) and FR2 ( $17.93 \pm 0.06\%$ ). Crude fat content was relatively similar across samples, ranging from  $6.61 \pm 0.02\%$  in FR3 to  $7.15 \pm 0.21\%$  in FR4. This suggests a modest contribution of fat from the plant-based additives such as groundnut and crayfish. Carbohydrate levels were generally high in all samples, ranging from  $56.34 \pm 0.01\%$  (FR4) to  $60.44 \pm 0.00\%$  (FR5). Moisture content was highest in FR3 ( $12.40 \pm 0.02\%$ ) and lowest in the control sample FR5 ( $7.02 \pm 0.00\%$ ). Correspondingly, dry matter was highest in FR4 ( $88.05 \pm 0.04\%$ ) and lowest in FR2 ( $87.69 \pm 0.03\%$ ), with no dry matter reported for FR5. Ash content, an indicator of mineral presence, was fairly consistent among FR1–FR4 (approximately 5.6–5.9%), but notably lower in FR5 ( $1.59 \pm 0.00\%$ ).



**Table 1:** Proximate Composition of Samples (% Mean  $\pm$  SD)

Nutrient (%)	FR1	FR2	FR3	FR4	FR5
Crude Fibre	0.57 $\pm$ 0.01	0.68 $\pm$ 0.02	0.72 $\pm$ 0.01	0.54 $\pm$ 0.21	3.87 $\pm$ 0.00
Protein	18.24 $\pm$ 0.08	17.93 $\pm$ 0.06	17.34 $\pm$ 0.08	18.43 $\pm$ 0.08	19.98 $\pm$ 0.00
Fat	7.10 $\pm$ 0.02	6.79 $\pm$ 0.03	6.61 $\pm$ 0.02	7.15 $\pm$ 0.21	7.10 $\pm$ 0.00
Ash	5.67 $\pm$ 0.03	5.81 $\pm$ 0.03	5.92 $\pm$ 0.02	5.61 $\pm$ 0.02	1.59 $\pm$ 0.00
Moisture	12.03 $\pm$ 0.03	12.31 $\pm$ 0.03	12.40 $\pm$ 0.02	11.95 $\pm$ 0.04	7.02 $\pm$ 0.00
Dry Matter	87.97 $\pm$ 0.03	87.69 $\pm$ 0.03	87.61 $\pm$ 0.02	88.05 $\pm$ 0.04	,
Carbohydrate	56.40 $\pm$ 0.03	56.49 $\pm$ 0.01	57.02 $\pm$ 0.04	56.34 $\pm$ 0.01	60.44 $\pm$ 0.00

### Mineral Composition of the Samples

Table 2 illustrates the mineral profile of the formulations. Calcium content ranged narrowly among the formulated samples, with values from 0.27  $\pm$  0.003% (FR4) to 0.29  $\pm$  0.001% (FR2 and FR3). The control (FR5) did not contain detectable calcium. Potassium levels were highest in FR2 and FR3 (0.91  $\pm$  0.002%), followed closely by FR1 (0.88  $\pm$  0.001%), again showing a lack of potassium in FR5. Sodium levels were consistent across FR1 to FR4 (approximately 0.25–0.27%), with no sodium detected in FR5. Iron content was considerably higher in FR1 (88.70  $\pm$  0.001%) and FR4 (88.77  $\pm$  0.021%) compared to FR2 and FR3 (both ~72%), while the control had significantly lower iron at 11.64  $\pm$  0.00%. Zinc content remained relatively stable across FR1 to FR4, with values ranging from 12.60–13.21%, again absent in the control sample.

**Table 2:** Mineral Composition of Samples (% Mean  $\pm$  SD)

Mineral (%)	FR1	FR2	FR3	FR4	FR5
Calcium	0.28 $\pm$ 0.003	0.29 $\pm$ 0.001	0.29 $\pm$ 0.001	0.27 $\pm$ 0.003	,
Potassium	0.88 $\pm$ 0.001	0.91 $\pm$ 0.002	0.91 $\pm$ 0.002	0.87 $\pm$ 0.001	,
Sodium	0.25 $\pm$ 0.001	0.27 $\pm$ 0.003	0.26 $\pm$ 0.001	0.25 $\pm$ 0.001	,
Iron	88.70 $\pm$ 0.001	72.58 $\pm$ 0.021	71.96 $\pm$ 0.02	88.77 $\pm$ 0.021	11.64 $\pm$ 0.00
Zinc	13.16 $\pm$ 0.021	12.70 $\pm$ 0.028	12.60 $\pm$ 0.01	13.21 $\pm$ 0.021	,

### Comparative Analysis of Proximate Composition

A one-way ANOVA was used to assess significant differences across the proximate parameters of the five samples. As shown in Table 3, statistically significant differences ( $p < 0.05$ ) were observed across all nutritional components, including crude fibre, protein, fat, ash, moisture, and carbohydrates.

**Table 3:** Statistical Comparison of Proximate Parameters (ANOVA)

Nutrient (%)	FR1	FR2	FR3	FR4	FR5	p-value
Fibre	0.57	0.68	0.72	0.53	3.87	0.000**
Protein	18.24	17.93	17.34	18.43	19.98	0.000**
Fat	7.10	6.79	6.61	7.15	7.10	0.000**
Ash	5.67	5.81	5.93	5.61	1.59	0.000**
Moisture	12.03	12.31	12.40	11.95	7.02	0.000**
Dry Matter	87.97	87.69	87.61	88.05	,	0.000**
Carbohydrate	56.40	56.49	57.02	56.34	60.44	0.000**

\*\*Statistical significance at  $p < 0.01$

\*Statistical significance at  $p < 0.05$

### Comparative Analysis of Mineral Composition

As summarized in Table 4, significant differences ( $p < 0.05$ ) were also observed in the mineral composition across the samples, particularly in calcium, potassium, sodium, iron, and zinc levels.

**Table 4:** Statistical Comparison of Mineral Composition

Mineral (%)	FR1	FR2	FR3	FR4	FR5	p-value
Calcium	0.28	0.29	0.29	0.27	,	0.000**
Potassium	0.88	0.92	0.91	0.87	,	0.000**
Sodium	0.25	0.27	0.26	0.25	,	0.000**
Iron	88.70	72.60	71.90	88.70	11.60	0.000**
Zinc	13.20	12.70	12.60	13.20	,	0.000**

\*\*Statistical significance at  $p < 0.01$

\*Statistical significance at  $p < 0.05$

### Sensory Evaluation

Sensory analysis results are presented in Table 5. All samples scored relatively high across parameters such as appearance, colour, aroma, taste, and texture. FR4 consistently received higher ratings, particularly in texture ( $7.40 \pm 0.52$ ) and taste ( $7.40 \pm 0.99$ ). The control sample (FR5) generally showed slightly lower sensory ratings across most attributes.

**Table 5:** Sensory Scores (9-Point Hedonic Scale)

Parameter	FR1	FR2	FR3	FR4	FR5
Appearance	$7.20 \pm 0.42$	$7.20 \pm 0.42$	$7.30 \pm 0.48$	$7.30 \pm 0.48$	$7.10 \pm 0.57$
Colour	$7.10 \pm 0.74$	$7.20 \pm 0.63$	$7.30 \pm 0.67$	$7.30 \pm 0.67$	$7.10 \pm 0.74$
Aroma	$7.40 \pm 0.84$	$7.50 \pm 0.71$	$7.50 \pm 0.71$	$7.30 \pm 0.82$	$7.30 \pm 0.48$
Taste	$7.10 \pm 0.99$	$7.00 \pm 0.94$	$7.00 \pm 0.94$	$7.40 \pm 0.99$	$7.00 \pm 0.94$
Texture	$6.30 \pm 1.16$	$6.30 \pm 1.16$	$6.50 \pm 1.18$	$7.40 \pm 0.52$	$6.20 \pm 1.23$

### Statistical Association of Sensory Evaluation

ANOVA analysis (Table 6) revealed no statistically significant differences ( $p > 0.05$ ) in sensory attributes among the samples. Although FR<sub>4</sub> had slightly higher average scores across multiple parameters, these variations were not statistically significant, indicating comparable sensory acceptability among the formulations.

**Table 6:** Association of Sensory Parameters

Parameter	FR <sub>1</sub>	FR <sub>2</sub>	FR <sub>3</sub>	FR <sub>4</sub>	FR <sub>5</sub>	p-value
Appearance	7.20	7.20	7.30	7.30	7.10	0.873
Colour	7.10	7.20	7.30	7.30	7.10	0.932
Aroma	7.40	7.50	7.50	7.30	7.30	0.942
Taste	7.10	7.00	7.00	7.40	7.00	0.998
Texture	6.30	6.30	6.50	7.40	6.20	0.100

\*\*Statistical significance at  $p < 0.01$

\*Statistical significance at  $p < 0.05$

### Discussion

Complementary feeding remains a critical phase in child nutrition, especially in low- and middle-income countries where early childhood undernutrition continues to contribute to preventable morbidity and mortality. The World Health Organization (WHO, 2023) emphasizes that nutritionally adequate, safe, and culturally acceptable complementary foods are essential for promoting optimal growth and development. In regions plagued by food insecurity and rising poverty levels, particularly in sub-Saharan Africa, ensuring access to affordable and nutrient-dense complementary foods is not only a public health priority but also a strategic approach toward poverty alleviation and sustainable development (Wudil et al., 2022). This study contributes to this broader goal by developing and evaluating four low-cost, home-preparable complementary food blends (FR<sub>1</sub>–FR<sub>4</sub>), each made primarily from white rice and soybean, enriched with various locally available nutrient-dense ingredients such as crayfish, groundnut, tiger nut, and dates. The commercial blend (FR<sub>5</sub>) was included as a control.

Existing literature supports the approach of using local food systems to address child undernutrition while enhancing community resilience. Adegbanke et al. (2017) formulated a complementary food from sweet potato, soybean, and groundnut and found it to be richer in vitamin A and protein than imported commercial foods. Similarly, Walle & Haile (2017) demonstrated that blending

cereal staples with legumes and animal-source foods improved protein quality and micronutrient density in home-prepared complementary foods. These studies align with the rationale behind the current formulation approach, particularly the use of soybean and crayfish in blends such as FR<sub>1</sub> and FR<sub>4</sub>. Additionally, Adegbusi et al. (2023) reported that crayfish not only improved protein content but also enhanced mineral bioavailability in cereal-based weaning foods, findings that reinforce the value of its inclusion in our formulations.

The present study further contextualizes these efforts within the framework of sustainable nutrition and food security. The use of ingredients like groundnut and tiger nut, which are readily cultivated in many parts of Nigeria and sub-Saharan Africa, underscores the potential for scalable, community-based interventions. As Rabiatsu & Yu (2020) observed, groundnut-fortified foods provide significant lipid energy and protein, while also being cost-effective. Tiger nut, though less common in complementary food formulations, has shown promise as a source of dietary fiber, healthy fats, and minerals (Yu et al., 2022), contributing to the diverse nutritional profile of FR<sub>3</sub> and FR<sub>4</sub> in this study. These ingredients are not only sustainable from an environmental perspective but also socially sustainable, as they can be cultivated, processed, and prepared by rural households, especially women.

Moreover, aligning with the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger) and SDG 3 (Good Health and Well-being), this study responds to the urgent need for food-based solutions to malnutrition that are both affordable and acceptable to low-income populations (Atukunda et al., 2021). Adegbusi et al. (2023) argued that improving complementary feeding through locally sourced, nutrient-rich foods can significantly reduce stunting and wasting among children under five. This claim resonates with the intent of the current research: to demonstrate that food formulations made from staples like white rice and soybean, when fortified strategically with accessible micronutrient-rich foods, can offer a cost-effective alternative to commercial products often out of reach for economically disadvantaged households.

The results of this study reveal that the formulated complementary food blends (FR<sub>1</sub>–FR<sub>4</sub>) showed significant improvement in proximate and mineral

composition compared to the control sample (FR5), reflecting the strategic nutritional value of each ingredient used. This aligns with previous findings by Anwar et al. (2024), who reported that the inclusion of legumes and animal-source proteins significantly enhanced the protein and mineral quality of complementary foods. In particular, FR1, which contains white rice, soybean, crayfish, and dates, showed high protein and ash content, highlighting the protein-rich and mineral-contributing potential of crayfish. This corroborates the findings of Adegbusi et al. (2023), who emphasized the role of crayfish in improving calcium and phosphorus content in weaning foods.

Soybean was a major component in all formulations, contributing significantly to protein and fat content. Adegbusi et al. (2023) similarly confirmed that soybean enhances the amino acid profile and energy density of cereal-based blends. In our study, the consistent use of 20–25% soybean across the blends supported improved protein quality, which is critical in early childhood to prevent protein-energy malnutrition (PEM), especially in poor communities with limited access to animal-source foods. This is particularly relevant for families living in poverty who often depend on cereals alone, which are deficient in essential amino acids.

Interestingly, FR3 and FR4, which incorporated tiger nut, showed an improved fat content and a relatively high energy value. Yu et al. (2022) noted that tiger nut is a rich source of healthy fats, minerals, and fiber, all of which contribute to satiety and sustained energy release in infants. The inclusion of tiger nut also supports dietary diversity, a key component of food security and sustainable nutrition. This is especially important in rural and low-income households where food variety is limited. Moreover, since tiger nut can be grown in marginal soil with minimal inputs, its use in complementary food production promotes environmental sustainability and economic empowerment among smallholder farmers, many of whom are women.

Groundnut, included in FR2 and FR4, contributed to the improved lipid and protein profile. This mirrors the findings of Rabiatsu & Yu (2020), who reported that groundnut fortification significantly boosts energy content and provides essential fatty acids needed for infant brain development. Furthermore, the lipid content from groundnut and soybean makes these formulations energy-dense, which is particularly vital in combating underweight and wasting in

young children, a widespread issue in food-insecure populations. The presence of dates across all experimental blends (FR<sub>1</sub>–FR<sub>4</sub>) also contributed to their natural sweetness and enhanced mineral content, particularly iron and potassium. Al-Shwyeh (2019) found that dates are rich in bioavailable micronutrients and natural sugars, which not only enhance taste but also improve acceptability. In poverty-stricken settings where iron-deficiency anemia is prevalent, especially among children and women, the iron-enhancing effect of dates makes them a valuable addition to home-prepared foods (Irandegani et al., 2019). Moreover, the use of dates addresses the challenge of dietary monotony and enhances palatability, which is crucial for infant acceptance and consistent feeding.

In terms of sensory acceptability, the experimental blends performed comparably with the commercial control, suggesting that low-cost, locally sourced ingredients can produce foods that are both nutritious and acceptable to caregivers and children. This finding is consistent with the report by Adegbusi et al. (2023), which showed that local blends using cereals and legumes were equally or more acceptable than imported products when adequately processed and formulated.

Comparing these findings with the control sample (FR<sub>5</sub>), which contained moringa and banana, the experimental blends showed a competitive nutritional profile despite the absence of some exotic or specialized ingredients. This suggests that locally available and culturally familiar ingredients can serve as practical alternatives to expensive commercial blends. Furthermore, by utilizing common staples like rice and enhancing them with diverse additions, the formulations cater to both nutritional adequacy and affordability. This has direct implications for poverty alleviation and food sovereignty, as families can prepare these blends at home with minimal cost and without relying on imported products.

## **Conclusion**

This study showed that locally made complementary foods using white rice, soybean, dates, crayfish, groundnut, and tiger nut can improve the nutrition of young children. The food blends had better protein, fat, and mineral content than the commercial product used as a control. They were also well accepted in taste and appearance. These results suggest that low-cost, local ingredients can

be used to fight malnutrition in infants and young children, especially in low-income families. The government should support programs that teach mothers and caregivers how to make these nutritious blends at home. Training and support should also be given to women who want to start small food businesses using local ingredients. This can help improve family income and reduce hunger. Health workers should include these local food options in nutrition education for families. Doing this can help improve child health, reduce poverty, and support food security in poor communities. Future research should study how well children absorb the nutrients in these blends. It is also important to check how long these foods can stay fresh and safe. More studies should test these foods in different regions and among larger groups of children. This will help show how useful and practical they are in real life.

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