

Public-Private Partnerships in driving Sustainable Agricultural Growth for Addressing Poverty and Food Insecurity in Nigeria

Yusuff Jelili Amuda¹, Rehana Parveen²

Abstract

Poverty and food insecurity have become a concern in various parts of the world including Nigeria which are regarded as impediments for achieving sustainable development goals (SDGs). Overwhelming studies have explored the roles and contributions of public-private partnerships (PPP) in driving various aspects of the economy in general and gross domestic product (GDP) in particular. However, less focus of attention is given to public-private partnerships (PPP) in fostering the sustainable agricultural growth in Nigeria in order to addressing poverty and food insecurity in Nigeria. Content and critical analysis is used in this study as a methodological approach. Secondary data were used which were sourced through academic databases such as journals from google scholar. The result demonstrated that the current hike in the price of commodities in the country contribute to the proliferation of poverty among the households and the challenges of kidnapping and banditry immensely contribute to the challenge of food security in the country. The challenge of funds identified among the farmers contribute immensely to high level of poverty and prevalence of food insecurity in the country. It is therefore suggested that the government should encourage provision of funds through an effective collaboration of public-private partnerships (PPP) in driving sustainable agriculture growth in the country. In so doing, it would strengthen the income of households through farming and sustainable agricultural productivity for poverty alleviation and food security will be achieved.

Keywords: *Poverty, Food Insecurity, Public-Private Partnerships (PPP) Gross Domestic Product (GDP), Sustainable Development Goals (SDGs).*

Introduction

The challenge of poverty in Nigeria is multifaceted and severe, with nearly half of the country's 200 million population living below the international poverty line of \$1.9 per day (Oluwaseun, 2017). Despite various poverty alleviation schemes, Nigeria became the poverty capital of the world in 2018, highlighting the ineffectiveness of past efforts. Geographical variations in poverty rates exist, with high clusters in northern Nigeria, where predictors include illiteracy rates and distance to the coast, while unemployment is a significant predictor in southern Nigeria (Ibem, 2011). Poverty and inequality are major obstacles to sustainable development in Nigeria, emphasizing the need for policies focusing on reducing poverty, investing in health and education, diversifying the economy, and promoting gender equality and anti-corruption measures as literature contends (Essia and Yusuf, 2013). Education, although significant, has not been effectively reducing poverty levels in Nigeria, suggesting the need for improvements in the educational system through an effective and supportive curricula that can foster agricultural friendly policy in order to promote employment and alleviate poverty as literature contends (Kadzere, Poswal, Ngada, Dayimani, Coetzee and Bese, 2016).

Furthermore, food insecurity in Nigeria is a significant issue affecting both urban and rural areas, particularly agricultural households who are vulnerable. Studies have shown that a large percentage of households in Nigeria are food insecure, with coping strategies such as compromising food quantity and quality being common, especially during times of food shortages (Adedokun, 2021). Factors contributing to food insecurity include poverty, uneven income distribution, and lack of access to basic services and assets. Additionally, food insecurity is associated with poor health outcomes, especially among citizens with malnutrition, highlighting the need for targeted interventions to improve food and water security to address poor health and malnutrition in Nigeria (Raidimi and Kabiti, 2017; Fanzo, Shawar, Shyam, Das and Shiffman, 2021). Various studies highlight the importance of improving agricultural policies, enhancing the

¹ College of Law, Prince Sultan University, Saudi Arabia, Email: yusuffja@psu.edu.sa.

² College of Law, Prince Sultan University Saudi Arabia, Email: rparveen@psu.edu.sa

agricultural value chain, and strengthening irrigation schemes to ensure long-term sustainability by solving the problem of poverty and food insecurity (Volleman, 2015).

This study is motivated from the emphasis of Sustainable Development Goals (SDGs) Sustainable in achieving zero hunger through sustainable agricultural growth. This is regarded as an important impetus in Nigeria for achieving food self-sufficiency, economic development, and poverty alleviation. Moreso, several studies have explored the contributions of Public-Private Partnerships (PPP) and they play a crucial role in various sectors of the economy, including healthcare, innovation development, entrepreneurial growth, and sustainable urban development (Smyth, Webb and Phillips, 2021). Undoubtedly, PPPs are instrumental in providing high-quality agricultural services while maintaining financial stability, fostering innovation and socio-economic development through long-term projects and critical technologies for fostering sustainable development in various sectors such as forestry, infrastructure development, global food security (Egugb and Omitogun, 2018; Popoola, Saka and Amusa, 2020; Smyth, Webb and Phillips, 2021). In so doing, it would be catalyzing entrepreneurial growth and creating a favourable business environment, and achieving sustainable development goals in cities through green economy initiatives considering the role of Public-Private Partnerships in different sectors that would enhance the sustainable agricultural activities (Onubuogu and Esiobu, 2014; Olomola and Adesugba, 2015; Ugwu, Adewusi and Nwokolo, 2024). Nonetheless, there is a gap in the existing body of knowledge in exploring PPP in addressing poverty, food insecurity and consequently achieving sustainable agricultural growth in Nigeria. The novelty of this study manifests from the fact that PPPs is explore in relation with the agricultural sector with specific attention on examining their roles in poverty reduction, food insecurity in achieving overall sustainable agricultural growth.

Literature Review

This section reviews relevant literature which covers the following: Agriculture versus Poverty Alleviation in Nigeria, Agriculture and Food insecurity in Nigeria, Sustainable Agricultural Growth in Nigeria and Public-Private Partnerships in Driving Agricultural Growth in Nigeria. Each of these is explained in the subsequent subheadings.

Agriculture versus Poverty Alleviation in Nigeria

The issue of poverty in Nigeria is complex and severe, as almost half of the nation's 200 million inhabitants live below the global poverty threshold of \$1.9 per day. Despite numerous initiatives aimed at reducing poverty, Nigeria was recognized as the global epicenter of poverty in 2018, underscoring the inefficacy of previous endeavours in transforming agriculture agenda through the participation public and private sectors (Ajani and Igbokwe, 2014). Disparities in poverty rates are evident across different regions, notably in the northern part of Nigeria, where factors such as illiteracy levels and proximity to the coastline contribute to higher poverty concentrations, whereas unemployment emerges as a significant determinant in the southern region and literature identifies public-private partnership (PPP) as an impetus for enhancing sustainable development in the country (Chisa, Ojo, Ikeni and Gambo, 2015). Current issues in agriculture in Nigeria include the challenge of poverty and food insecurity despite the sector's significant contribution to the country's GDP. Access to finance remains a major hurdle for smallholder farmers, hindering sustainable agricultural production for food security whereby literature considers public-private partnership as an important instrument in achieving sustainable development goals with specific focus on the agricultural sector of the economy (Ojelabi, Fagbenle, Afolabi, Tunji-Olayeni and Amusan, 2018; Arimoro and Elgujja, 2019; Maslova, 2020). Additionally, the lack of modern farming techniques and tools among elderly farmers, who currently dominate the sector, poses a barrier to attracting educated youth to agriculture. Environmental degradation due to traditional and modern agricultural practices further threatens sustainable development, emphasizing the need for better environmental management and conservation efforts for the growth of agricultural sector as literature posits (Adebayo, Babu, Sanusi and Sofola, 2015; Downie, 2019). In other words, the degradation of the environment resulting from both traditional and modern agricultural practices poses a further threat to sustainable development, underscoring the critical need for enhanced environmental management and conservation efforts. Literature considers the adoption

of climate-smart technologies with the role of public-private partnerships in solving the problem of environmental degradation (Senyolo, Long and Omta, 2021). Moreover, the limited public sector funding and minimal private sector investment in agriculture highlight the necessity for improved collaboration through public-private partnerships to drive sectoral growth and profitability (Leigland, 2018; Opaowole, Jagboro, Kajimo-Shakantu and Olojede, 2019).

Agriculture plays a crucial role in poverty alleviation in Nigeria. Studies have shown that agricultural development can significantly reduce poverty levels in the country, emphasizing the importance of improving agriculture, transportation, and oil rent to complement each other in poverty reduction with specific focus on the public-private-partnership in the agricultural sector (Tijani, 2015; Njeru, 2017). However, challenges such as low access to agricultural finance and poor market access hinder household productivity and income, contributing to high poverty incidences in states like Bauchi, Gombe, Jigawa, and Kano. Furthermore, rural farm households face a high incidence of poverty, with factors like farm size, household size, and market travel costs influencing poverty status, especially in the northern geo-political zones. Initiatives like Youth Participation in Agribusiness Programmes (YIAPs) through the enhancement of public-private partnership have shown positive impacts on poverty reduction among youth, highlighting the need for strengthened intervention programmes to improve youth welfare and reduce poverty vulnerability in the country (Adekeye, 2023). To effectively decrease poverty and eradicate hunger in Nigeria, enhancing agricultural output and food production through government support, modern farming equipment, power supply, credit facilities, and market access and the roles of public-private partnership are crucial steps identified in the cursory literature (Trithara, 2016; Bragdon and Hayes, 2017; Saha, 2019).

Poverty and inequality pose significant challenges to sustainable development in Nigeria, underscoring the necessity for policies that prioritize poverty reduction, investments in agriculture, economic diversification, and the promotion of gender equality, youth and women's involvement in agriculture are important measures for agricultural transformation in the country (Ajani and Igbokwe, 2014). Despite the considerable importance of agriculture, its impact on poverty reduction in Nigeria has been limited, indicating the imperative need for agricultural enhancements to foster employment opportunities, food security or food supply and alleviate poverty and hunger in the country as literature contends (Thomas, Thomas, Turk and Turk, 2023).

Agriculture and Food insecurity in Nigeria

Literature has emphatically stressed the need for addressing development challenges in Nigeria (Dabak, 2014). The issue of food insecurity in Nigeria is a pressing concern affecting both urban and rural areas, especially households that are vulnerable which is an impediment for achieving development that literature advocates for (Dabaka, 2014; Saha, 2019; Benjamin, Ola, Lang and Buchenrieder, 2021). Research indicates that a substantial proportion of Nigerian households' experience of food insecurity, resorting to measures like compromising on food quantity and quality, particularly during periods of food scarcity as currently being experienced in Nigeria (Volleman, 2015). Factors contributing to food insecurity comprise poverty, unequal income distribution, and insufficient access to essential services and resources. Furthermore, food insecurity is linked to adverse health outcomes, particularly among marginalized groups such as sexual and gender minorities living with HIV, emphasizing the urgency of targeted interventions to enhance food security and tackling the challenges of hunger in the country (Fanzo, Shawar, Shyam, Das and Shiffman, 2021). Effectively addressing these challenges necessitates the implementation of sustainable policies, enhancements in infrastructure, and support for agricultural practices to improve food availability and accessibility for all Nigerian citizens. (Bragdon and Hayes, 2017; Benjamin, Ola, Lang and Buchenrieder, 2021).

Agriculture plays a crucial role in addressing food insecurity in Nigeria, as evidenced by various studies. Research indicates that sustainable food production is essential for achieving food security in the country, with agricultural policies directly impacting food security outcomes (Trithara, 2016). Additionally, the resilience of agricultural households to food insecurity is influenced by factors such as access to basic services, assets, and adaptive capacity, highlighting the importance of improving farmers' income and food access (Raidimi, and Kabit, 2017). Furthermore, the link between crop diversity and dietary diversity

underscores the significance of promoting diverse agricultural practices to enhance food security among farming households in Nigeria. Moreover, building resilience among farmers to withstand shocks and stressors is crucial in combating food insecurity, emphasizing the need for investments across various resilience pillars and indicators to improve food security outcomes in the country (Trithara, 2016). Indeed, the relationship between food security, agricultural research, technology innovation, and economic growth underscores the importance of investing in agricultural research and technology to enhance food security in the country (Nwoye, 2018).

Food security in Nigeria faces challenges due to factors like poverty, population growth, and inadequate agricultural practices. Studies highlight the importance of governance mechanisms, infrastructure improvement, and educational opportunities in addressing poverty and food insecurity in order to achieve sustainable agricultural practices in Nigeria (Mgbada, Ohajianya and Nzeh, 2016). Research emphasizes the need for strategic attention to food security issues, especially in the face of population growth and external crises that may impede the adequate implementation of agricultural policies and programmes in the country (Amuda, 2022). Despite the fact that literature contends that protectionist agricultural policies in Nigeria have not significantly increased food production, indicating the complexity of achieving food security through trade policies (Ntagu, Nyam and Promise, 2022); the study by Amuda and Alabdulrahman (2024) have clamoured for the adoption of smart technology for boosting agricultural efficiency in achieving socio-economic development in the country. Household-level determinants of food security among rice farmers in Nigeria include factors like farm size, educational attainment, and credit constraints. Additionally, remittances from migrants play a crucial role in mitigating economic challenges and improving household food security in rural Nigeria. Literature has emphasized the need for effective agricultural programmes and development strategies for attaining sustainable agricultural practices in combating food insecurity in the country as literature contends (Adesida, Nkomoki, Bavorova and Madaki, 2021; Adetuyi, Tarbert and Harrison, 2023).

Sustainable Agricultural Growth in Nigeria

This part explains sustainable agricultural growth in Nigeria. Undoubtedly, Sustainable Development Goals (SDGs) in Nigeria encompass various aspects such as innovative university education for sustainable development, access to clean water and sanitation, poverty alleviation programmes, and the transition from Millennium Development Goals (SDGs) to SDGs (Arimoro and Elguja, 2019; Richards, 2021). Several studies have examined SDGs from various perspectives such as education (Enyia and Emelah, 2023); infrastructural development (Essia and Yusuf, 2013; Ojelabi, Fagbenle, Afolabi, Tunji-Olayeni and Amusan, 2018; Sanni, 2018); agribusiness sustainability (Obayelu, 2018); Challenges in achieving these goals include lack of technological knowledge, inadequate funding, poor water quality, and the impact of a poverty mentality on poverty alleviation efforts as literature posits (Oluwaseun, 2017). To address the agricultural challenges, there is a need for innovative infrastructure development in Nigerian agricultural sector, improved water quality standards, comprehensive policy frameworks, community participation in agriculture for SDGs awareness, and a shift towards multidimensional poverty approaches focusing on investment in agriculture and value reorientation that would be instrumental in achieving overall sustainable development (Adedokun, 2021). By tackling these issues comprehensively, Nigeria can progress towards achieving the SDGs and improving the overall quality of life for its citizens. Hence, agricultural sector is an important sector towards achieving sustainable agricultural growth and development (Rehman, Tanzila, Muhammad, Suliman, Saeed, and Huma, 2022).

Sustainable agricultural development in Nigeria faces challenges stemming from poor management during drought spells, inefficient implementation of agricultural policies, under-utilization and poor management of irrigation schemes, and the need for a suitable and sustainable environment for agricultural productivity (Olaoye and Rotimi, 2010). To achieve sustainable agricultural development, strategies should focus on improving drought management skills, filling gaps in existing agricultural frameworks, enhancing water use efficiency in irrigation schemes, and ensuring a conducive environment for agricultural productivity (Ojong and Anam, 2018). Additionally, customary tenancy practices can play a vital role in accessing land for long-term agricultural business, promoting access to land resources, and reducing tensions in rural communities (Ojong and Anam, 2018). By addressing these challenges and leveraging traditional land practices, Nigeria

can work towards achieving sustainable agricultural development for food security, economic growth, and environmental preservation (Oyewole and Sennuga, 2020).

The agricultural sector's positive impact on GDP underscores its significance in driving economic growth in Nigeria is crucial for achieving food self-sufficiency, economic development, and poverty alleviation through the instrumentality of social investment programmes (Jimoh and Mustapha, 2020). Various studies highlight the importance of improving agricultural policies, enhancing the agricultural value chain, investing in irrigation schemes, and promoting sustainable skill acquisition in agriculture to drive economic growth and ensure food security (Adekilekun and Gan, 2014). Challenges such as under-utilization of irrigation schemes, inadequate attention to different stages of the agricultural value chain, and the need for increased investment in the sector have been identified as hindrances to sustainable agricultural growth in the country (Oyewole and Sennuga, 2020). To overcome these obstacles, there is a call for effective policy implementation, increased investment by both government and private sectors, strengthening linkages between agriculture and other sectors, and improving water use efficiency and management practices in irrigation schemes. Sustainable agricultural growth, emphasizing the need for increased investment and value addition in agricultural investment (Adam, 2018). Furthermore, sustainable skill acquisition in agriculture plays a vital role in boosting economic growth and addressing food security challenges, necessitating improved agricultural education centers and funding support from the government. Addressing challenges in irrigation schemes, enhancing the value chain, and promoting skill acquisition are essential steps towards achieving sustainable agricultural growth in reducing poverty and enhancing economic development in Nigeria (Oloyede, 2014; Monyei, Onyekwelu, Emmanuel and Taiwo, 2023).

Public-Private Partnerships in Driving Agricultural Growth in Nigeria

This part explains the paramount importance of Public-Private Partnerships (PPPs) in connection with various sectors of the economy. For instance, literature posits that PPPs have been playing significant roles in building infrastructure for clean energy (Ugwu, Adewusi and Nwokolo, 2024). Public-Private Partnerships (PPPs) are pivotal in various sectors of the economy, such as healthcare, housing infrastructure, innovation development, entrepreneurial expansion, and sustainable urban growth (Ahmed and Sipan, 2019; Muhammad and Johar, 2019; Udoh and Mbon, 2023). PPPs play a vital role in furnishing top-notch medical services while upholding financial stability, fostering innovation and socio-economic progress. This can be achieved through enduring projects and crucial technologies, propelling entrepreneurial growth and establishing a conducive business environment, and attaining sustainable development objectives in urban areas via environmentally friendly economic initiatives (Ejumudo, 2013; Babatunde, 2015; Olatunji, Olawumi and Ogunsemi, 2016). These partnerships entail cooperation between public bodies and private sectors across prolonged durations, distributing risks and finances to provide value appreciated by both parties (Okwilagwe, 2017). By bolstering infrastructure governance, backing small and medium enterprises, and encouraging sectoral cooperation, PPPs substantially contribute to agricultural transformation and subsequently foster economic progress and societal welfare across diverse economic domains (Rankin, Nogales, Santacoloma, Mhlanga and Rizzo, 2017).

Public-private partnerships (PPPs) play a crucial role in fostering agricultural activities and socio-economic growth in Nigeria. Studies emphasize the significance of PPPs in education development, revenue generation, and infrastructure sustainability, particularly in various institutions of higher learning in achieving sustainable development in the country (Essia and Yusuf, 2013; Maslova, 2020; Richards, 2021). Additionally, the use of PPPs for public projects has shown promising results in improving the socio-economic status of communities through agricultural activities and enhancing overall economic activities, as evidenced by various agricultural projects by the government which encourage youth participation in the country (Richards, 2021). Furthermore, research highlights the importance of emphasizing infrastructure development through PPPs to stimulate private sector investment and sustain long-term agricultural and economic growth in the country (Adekilekun and Gan, 2014; Fadeyi, Kehinde, Nwachukwu, Adegbuyi and Agboola, 2018). Overall, leveraging PPPs in various sectors is essential for addressing agricultural and socio-economic challenges using agriculture as a tool for poverty alleviation and consequently driving sustainable development in Nigeria (Kolawole, 2021; Kehinde and Ogundeji, 2022; Gidigbi, 2023).

In Nigeria, current public-private partnership (PPP) initiatives aim to address critical social and economic infrastructure needs, with a focus on improving agriculture, food security and socio-economic factors in local communities (Trithara, 2016). While there have been expectations for significant progress through PPP projects, challenges persist in their implementation, hindering optimal outcomes in using agricultural for rural development literature contends (Adekeye, 2023). Research suggests that agricultural development should be prioritized through PPPs to stimulate private sector investment in the sector, thereby fostering long-term economic growth (Benjamin, Ola, Lang and Buchenrieder, 2021). Additionally, findings indicate that both public and private investments play a crucial role in economic growth, with private investment particularly contributing more during expansion periods, highlighting the importance of innovative government spending strategies to boost the agricultural and economic activities (Trithara, 2016). Efforts to enhance PPP implementation and address challenges can lead to eradication of hunger and improved agriculture, socio-economic conditions and sustainable growth in Nigeria (Bragdon and Hayes, 2017; Benjamin, Ola, Lang and Buchenrieder, 2021).

Public-private partnerships (PPPs) play a crucial role in driving agricultural growth in Nigeria by leveraging the strengths of both sectors. Research indicates that private financing is more effective at improving agricultural output than public finance, emphasizing the importance of encouraging private investment in agriculture in order to address the challenges of unemployment in the country (Ajani and Igbokwe, 2014; Adebayo and Ayegbusi, 2017). Literature identifies dialogue as an important mechanism for addressing the problem of low participation of PPPs in different sectors such as agriculture (Sagagi, 2014). Nonetheless, some other studies have highlighted the success of PPPs in housing provision, infrastructural development among others (Ibem, 2011; Ibem and Aduwo, 2012a; Ibem and Aduwo, 2012b). Additionally, it can be reiterated that PPPs can facilitate the implementation of innovation projects in the agro-industrial complex, leading to increased productivity, environmental preservation, and poverty alleviation in achieving sustainable development (Fadeyi, Kehinde, Nwachukwu, Adegbuyi and Agboola, 2018). Furthermore, literature advocates for sustainable agricultural development and PPPs can address the limited public sector funding and minimal private sector investment in agriculture by pooling resources and creating income streams for investors, ultimately enhancing the sector's development and sustainability (Dabak, 2014; Njeru, 2017; Arimoro and Elgujja, 2019). By fostering collaboration between the public and private sectors through PPPs, Nigeria can achieve significant advancements in its agricultural industry (Adebayo, Babu, Sanusi and Sofola, 2015; Opawole, Jagboro, Kajimo-Shakantu, Olojede, 2019).

Public-private partnerships (PPPs) play a significant role in poverty reduction and sustainable development by enhancing various sectors of the economy. Undoubtedly, PPPs projects have been shown to significantly improve the agricultural and socio-economic spheres of the society through different activities (Opawole, Jagboro, Kajimo-Shakantu, Olojede, 2019). Additionally, PPPs effort in education have helped address budget constraints and promote educational development, ensuring quality and sustainability while fostering international cooperation (Tijani, 2015). In the Nigerian context, PPPs have become a standard policy for providing and managing public assets, with the private sector contributing expertise and resources to meet the increasing demand for agriculture in developing countries like Nigeria (Benjamin, Ola Lang and Buchenrieder, 2021; Adekeye, 2023). By engaging the private sector strategically, Nigeria can leverage PPPs to achieve Sustainable Development Goals, enhance agriculture, improve food security, reduce poverty, and promote sustainable development in line with the SDGs (Oluwaseun, 2017; Arimor and Elgujja, 2019; Adedokun, 2021; Richards, 2021).

Materials and Methods

The methodological approach utilized in this study involves conducting content analysis within the framework of qualitative research. Prior research has predominantly relied on systematic literature reviews to establish relationships among various research pieces (Klimanov and Tretyak, 2019; Kraus, Breier and Dasí-Rodríguez, 2020; Khan, Shah, Yu and Tanveer, 2022; Kraus, S., Breier, Lim, Dabić, Kumar, Kanbach, Ferreira, 2022; Kraus, Mahto and Walsh, 2023). Nonetheless, there has been a noticeable absence of focus on systematic literature reviews in studies related to the Public-Private Partnerships in fostering sustainable agricultural growth for solving the problem of poverty and food insecurity in Nigeria. This research seeks

to fill this gap by employing a systematic literature review to investigate the involvement of Public-Private Partnerships in addressing poverty and food insecurity in the country in order to promote sustainable development. The study extensively reviews a variety of scholarly works through content analysis and systematic literature review. Additionally, it focuses specifically on policy-oriented research regarding the primary elements of the investigation. Various databases, library resources, and Google Scholar were thoroughly explored for pertinent scholarly articles. The study employed Visualization of Similarities (VOS) to identify principal themes, namely: Agriculture versus poverty alleviation, agriculture and food insecurity, sustainable agricultural growth and Public-Private Partnerships in driving agricultural growth. A total of seventy-six (76) articles were examined as secondary sources for this research. The content analysis undertaken in this study meticulously elucidates the results, making a significant contribution to the current literature on the agricultural sector. This study provides valuable insights for future empirical research within the broader realm of agriculture (Abunadi, Amjad, Khalid, Lorena, and Jaime, 2022).

Results and Discussion

This section presents results and overall discussion of the study based on the themes generated from the cursory literature which are as follows: Agriculture versus poverty alleviation, agriculture and food insecurity, sustainable agricultural growth and Public-Private Partnerships in driving agricultural growth. Each of these is explained in subsequent paragraphs.

First, poverty has been explored and various mechanisms for its alleviation have been recognized in previous studies. This study has argued that agriculture is an essential factor for solving the problem of poverty, despite the sector's substantial contribution to the nation's GDP. The cursory studies have identified poverty is an impediment to overall spheres of socio-economic development in Nigeria (Kolawole, 2021). This assertion has been buttressed that the obstacle of accessing finance remains a significant barrier for smallholder farmers, impeding sustainable agricultural production aimed at ensuring that poverty is alleviated (Gidigbi, 2023). Moreover, the absence of modern farming techniques and tools among elderly farmers, who currently dominate the sector, acts as a deterrent to attracting educated youth to engage in agriculture as a mechanism for poverty alleviation in the country. Moreover, agriculture plays a pivotal role in poverty alleviation in Nigeria, as evidenced by studies demonstrating that agricultural progress can substantially diminish poverty rates through social capital networks in the country (Kehinde and Ogundeji, 2022). This underscores the significance of enhancing agriculture for empowerment and poverty mitigation as literature suggests (Kolawole, 2021). Nevertheless, challenges such as restricted access to agricultural financing and inadequate market entry hinder household productivity and income, thereby contributing to elevated poverty levels in various States like Bauchi, Gombe, Jigawa, and Kano respectively (Oloyede, 2014). Furthermore, rural farm households encounter a heightened incidence of poverty, with factors such as farm size, household size, and market transportation expenses influencing poverty levels, particularly in the northern geo-political zones. Literature posits that Initiatives like the Youth Participation in Agribusiness Programmes (YIAPs) as part of National Social Investment Programme have demonstrated positive outcomes in reducing poverty among young individuals, underscoring the necessity for reinforced intervention schemes to enhance youth well-being and reduce susceptibility to poverty (Adam, 2018; Monyei, Onyekwelu, Emmanuel and Taiwo, 2023). Additionally, the insufficiency of public sector funding and limited private sector investment in agriculture underscore the importance of fostering improved collaboration through public-private partnerships to propel growth and profitability within the sector in order to achieve poverty reduction (Trithara, 2016; Benjamin, Ola, Lang and Buchenrieder, 2021).

Second, agriculture assumes a pivotal role in addressing food insecurity in Nigeria, as demonstrated by a variety of research studies (Volleman, 2015). Evidence suggests that ensuring sustainable food production is indispensable for attaining food security within the nation, with direct implications of agricultural policies on food security outcomes (Adedokun, 2021). Factors such as the accessibility to fundamental services, possession of assets, and adaptive capacity significantly influence the resilience of agricultural households against food insecurity, underscoring the necessity of enhancing farmers' income and food accessibility (Smyth, Webb and Phillips, 2021). The correlation between crop diversity and dietary variety emphasizes the importance of advocating for varied agricultural methods to bolster food security among farming

communities in Nigeria. Fostering resilience among farmers to endure shocks and stressors stands as a critical element in combating food insecurity, accentuating the imperative nature of allocating resources towards diverse resilience dimensions and metrics to enhance food security results in the nation (Raidimi and Kabiti, 2017). Hence, the interconnection among food security, agricultural research, technological advancements, and economic development underscores the significance of investing in agricultural research and technology to elevate food security levels through public-private partnerships (PPPs) in Nigeria (Raidimi and Kabiti, 2017). Food security challenges in Nigeria are attributed to various factors such as poverty, population growth, and insufficient agricultural practices. The significance of governance mechanisms, enhancement of infrastructure, and provision of educational opportunities in combating poverty and food insecurity in Nigeria is underscored by previous studies (Adedokun, 2021; Smyth, Webb and Phillips, 2021). It is emphasized in studies that a strategic focus on food security issues in sub-Saharan Africa is imperative, particularly in light of current population growth (Benjamin, Ola, Lang and Buchenrieder, 2021). Literature affirms the limited impact of protectionist agricultural policies on food production in Nigeria suggests the intricate nature of attaining food security through agricultural diversification that would lead to eradication of hunger (Bragdon and Hayes, 2017). Literature identifies various determinants of food security at the household level among farmers in Nigeria which encompass aspects like farm size, level of education, and constraints related to accessing credit (Mgbada, Ohajianya and Nzeh, 2016; Adesida, Nkomoki, Bavorova and Madaki, 2021). Furthermore, the contribution of remittances from migrants is highlighted as pivotal in alleviating economic challenges and enhancing household food security in rural Nigeria (Olaoye and Rotimi, 2010).

Third, the advancement of sustainable agriculture in Nigeria is imperative in attaining self-sufficiency in food production, fostering economic progress, and mitigating poverty. Diverse research emphasizes the significance of enhancing agricultural policies, improving the agricultural value chain, investing in irrigation projects, and facilitating sustainable capacity building in agriculture to stimulate economic development and ensure food security as literature contends (Ojong and Anam, 2018; Ntagu, Nyam and Promise, 2022). Obstacles such as the suboptimal utilization of irrigation projects, insufficient focus on various phases of the agricultural value chain, and the necessity for heightened investments in the sector have been recognized as barriers to sustainable agricultural development and productivity in the country (Olaoye and Rotimi, 2010; Onubuogu and Esiobu, 2014; Olomola and Adesugba, 2015). To surmount these challenges, there is a demand for efficient policy execution, increased investments from both public and private sectors, reinforcement of connections between agriculture and other industries, and enhancement of water usage effectiveness and management techniques sustainable agricultural projects and practices (Oyewole and Sennuga, 2020). The analysis of cursory literature contends that Public-private partnerships (PPPs) are instrumental in promoting socio-economic growth in Nigeria, with a particular focus on agricultural development, revenue generation, and infrastructure sustainability. This is in agreement with previous studies that affirmed that the utilization of PPPs for public projects has demonstrated promising outcomes in enhancing the agriculture and boosting socio-economic activities in the country (Adesida, Nkomoki, Bavorova and Madaki, 2021; Adetuyi, Tarbert and Harrison, 2023). Moreover, scholarly research underscores the significance of prioritizing agricultural development through PPPs to stimulate private sector investments and ensure long-term agricultural prosperity and economic growth within the nation (Ajani and Igbokwe, 2014; Benjamin, Ola, Lang and Buchenrieder, 2021). In essence, the strategic deployment of PPPs across various sectors is imperative for tackling socio-economic challenges and fostering sustainable development in Nigeria. In Nigeria, ongoing public-private partnership (PPP) endeavours are geared towards addressing crucial social and economic infrastructure requirements, with a specific emphasis on enhancing agricultural and socio-economic activities. Despite the anticipated progress from PPP projects, challenges persist in their execution, thereby impeding optimal results. Studies propose that agricultural development should be given precedence through PPPs to encourage private sector investments, consequently fostering sustained economic growth in the long run (Ojebode, 2016; Trithara, 2016; Fanzo, Shawar, Shyam, Das and Shiffman, 2021). Furthermore, research findings suggest that both public and private investments are pivotal for economic advancement, with private investments playing a more significant role during periods of expansion, underscoring the importance of innovative government expenditure strategies to bolster the agriculture and economy (Benjamin, Ola, Lang and Buchenrieder, 2021; Adekeye, 2023). Enhancing the implementation of PPPs and addressing associated challenges can lead to

improved socio-economic conditions and sustainable agricultural growth in Nigeria (Arimoro and Elgujja, 2019). Moreover, Public-private partnerships (PPPs) have a crucial role in advancing agricultural growth in Nigeria through the synergistic utilization of the strengths of both sectors. These partnerships involve collaboration between public entities and private sectors over extended periods, sharing risks and finances to deliver value appreciated by both parties in fostering agricultural sustainability (Ojelabi, Fagbenle, Afolabi, Tunji-Olayeni and Amusan, 2018). Studies indicate that private financing is more effective in enhancing agricultural productivity compared to public finance, underscoring the necessity of encouraging private investments in agriculture (Adebayo, Babu, Sanusi and Sofola, 2015; Njeru, 2017; Downie, 2019). Additionally, PPPs can facilitate the execution of innovative projects in the agro-industrial domain, resulting in heightened productivity, environmental conservation, and poverty alleviation. Furthermore, PPPs can tackle the limited public sector funding and insufficient private sector investments in agriculture by pooling resources and establishing revenue streams for investors, consequently bolstering the agriculture sector's progression and sustainability as literature contends (Leigland, 2018; Opawole, Jagboro, Kajimo-Shakantu and Olojede, 2019). By fostering collaboration between the public and private sectors via PPPs, Nigeria can make significant strides in its agricultural sector. Public-private partnerships (PPPs) are pivotal in reducing poverty and promoting sustainable development in Nigeria through the enhancement of socio-economic factors, educational improvement, and infrastructure development. PPP initiatives have demonstrated notable enhancements in the socio-economic conditions of communities by stimulating economic activities and augmenting agricultural values (Okwilagwe, 2017). Additionally, PPP endeavours in the agricultural sphere have effectively tried to address financial constraints and propelled agricultural advancement, ensure quality and continuity while fostering food security as literature contends (Smyth, Webb and Phillips, 2021). Within the infrastructure domain, literature posits that PPPs have evolved into a standard approach for delivering and managing public assets, with the private sector contributing expertise and resources to meet the escalating demand for sustainable agricultural development in developing nations by harnessing the potential of PPPs to realize zero hunger as an integral part of Sustainable Development Goals (Adedokun, 2021).

Conclusion and Suggestions

This study has explored the problems of poverty and food insecurity in Nigeria. It has been explicitly elaborated that sustainable agricultural growth in Nigeria is imperative for the attainment of food self-sufficiency, economic progress, and poverty reduction. More importantly, it has been demonstrated that public-private partnerships are important for achieving sustainable agricultural growth. In so doing, it will subsequently bring about the positive influence of the agricultural sector on GDP as it highlights its importance in propelling economic advancement, accentuating the necessity for heightened investment and value augmentation in agriculture. Moreover, the paper has elucidated that the sustainable acquisition of skills in agriculture plays a pivotal role in stimulating economic growth and tackling food security issues, necessitating enhanced agricultural education facilities and financial backing from governmental sources. However, several challenges impeding the roles of PPPs in sustaining agricultural sector have been highlighted in this paper. Despite the fact that this study depends on secondary data, it has laid a substantial foundation for future studies that would target using primary data in exploring the themes explored in this study. Therefore, the following suggestions are provided:

The government should provide an effective mechanism for enabling youth to actively partake in Agribusiness Programmes in order to achieve positive outcomes in reducing poverty among young individuals.

There is a need for reinforced intervention schemes by the public-private partnerships (PPP) in order to enhance youth well-being and reduce susceptibility to poverty.

To effectively diminish poverty in Nigeria, it is imperative to enhance agricultural output and food production through governmental backing, modern farming machinery, electricity supply, credit provisions, and market accessibility.

Tackling the obstacles in irrigation systems, enhancing the value chain, and fostering skill acquisition are pivotal strides towards realizing sustainable agricultural development in Nigeria.

By enhancing infrastructure governance, supporting small and medium enterprises, and promoting sectoral collaboration, Public-Private Partnerships (PPPs) contribute significantly to sustainable agricultural growth and societal well-being across different sectors of the economy.

The implementation of sustainable agricultural policies, infrastructure improvements, and support for agricultural practices to enhance food availability and accessibility for all Nigerians are necessary for addressing multifarious issues relating to poverty and food insecurity in the country.

Acknowledgments: The authors would like to acknowledge the support of Prince Sultan University for paying the Article Processing Charges (APC) of this publication.

References

- Abunadi, I, Amjad, R, Khalid, H, Lorena, P, and Jaime. (2022) "Traffic-Aware Secured Cooperative Framework for IoT-Based Smart Monitoring in Precision Agriculture" *Sensors* 22, no. 17: 6676. <https://doi.org/10.3390/s22176676>
- Adam, I. S. (2018). National Social Investment Programme: The Potential to Achieve the Sustainable Development Goal on Poverty Eradication through the Conditional Cash Transfer Programme in Nigeria.
- Adebayo, F. A., & Ayegbusi, E. T. (2017). Public-Private Partnership as Mechanism for Employment Creation in Nigeria. *Journal of Education and Practice*, 8(9), 178-185.
- Adebayo, K., Babu, S. C., Sanusi, R., & Sofola, M. (2015). Private sector participation in agricultural extension for cocoa farming in Nigeria: the case of multi-trex integrated foods. In *Knowledge Driven Development* (pp. 141-162). Academic Press.
- Adedokun, B. (2021). Nigeria's food insecurity and its implications on sustainable development goal (SDG) 2 amidst the COVID-19 era. *Journal of Good Governance and Sustainable Development in Africa*, 6(5), 18-26.
- Adekeye, J. A. (2023). Public-Private Partnership in Agriculture and Rural Development: The Shonga Farm, Kwara State Experience. *Public Administration & Regional Studies*, 16(2), 136-158.
- Adekilekun, M. T., & Gan, C. C. (2014). Public-private partnerships in infrastructure development in Nigeria: a catalyst for national security. *International Journal of Procurement Management* 4, 7(6), 750-766.
- Adesida, I. E., Nkomoki, W., Bavorova, M., & Madaki, M. Y. (2021). Effects of agricultural programmes and land ownership on the adoption of sustainable agricultural practices in Nigeria. *Sustainability*, 13(13), 7249.
- Adetuyi, A., Tarbert, H., & Harrison, C. (2023). Developmental Strategy for Agriculture in Nigeria. In *Contextualising African Studies: Challenges and the Way Forward* (pp. 129- 151). Emerald Publishing Limited.
- Ahmed, Y., & Sipan, I. A. B. (2019). Critical success factors of public private partnership for affordable housing in Nigeria. *International Journal of Recent Technology and Engineering*, 8, 57-69.
- Ajani, E. N., & Igbokwe, E. M. (2014). A review of agricultural transformation agenda in Nigeria: The case of public and private sector participation. *Research Journal of Agriculture and Environmental Management*, 3(5), 238-245.
- Amuda, Y. J. (2022). Evaluation of agricultural policies and programmes for sustainable future farming intensification in Nigeria. *International Journal of Service Science, Management, Engineering, and Technology (IJSSMET)*, 13(1), 1-13.
- Amuda, Y. J., & Alabdulrahman, S. (2024). Cocoa, Palm Tree, and Cassava Plantations among Smallholder Farmers: Toward Policy and Technological Efficiencies for Sustainable Socio-Economic Development in Southern Nigeria. *Sustainability*, 16(2), 477.
- Arimoro, A., & Elguja, A. (2019). Public-private partnership and the achievement of sustainable development goals: the role of subnational governments.
- Atobatele, A. J. Public Private Partnership Versus Socio-Economic Development: Panacea to Achieving Economic Growth in Nigeria.
- Babatunde, S. O. (2015). Developing public private partnership strategy for infrastructure delivery in Nigeria. University of Northumbria at Newcastle (United Kingdom).
- Benjamin, E. O., Ola, O., Lang, H., & Buchenrieder, G. (2021). Public-private cooperation and development in Sub-Saharan Africa: a review of Nigerian growth enhancement scheme and e-voucher program. *Food Security*, 13(1), 129-140.
- Bragdon, S. H., & Hayes, C. (2017). Reconceiving Public-Private Partnerships to Eradicate Hunger: Recognizing Small-Scale Farmers and Agricultural Biological Diversity and the Foundation of Global Food Security. *Geo. J. Int'l L.*, 49, 1271.

- Chisa, O. S., Ojo, V. K., Ikeni, N. O., & Gambo, A. A. I. (2015). Public-private partnership (PPP) as catalyst for sustainable infrastructural development (Effort of rivers, cross rivers, Oyo and Lagos State government). *International Journal of Engineering Science Invention*, 4(2), 53-69.
- Dabak, P. D. (2014). Public-private Partnership: The answer to Nigeria's development challenges. *Journal of Economics and Sustainable Development*, 5(22), 143-147.
- Downie, R. (2019). Growing the agriculture sector in Nigeria. *Gates Open Res*, 3(98), 98.
- Egugb, C., & Omitogun, O. (2018). Public-Private Partnership and Infrastructural Development in Nigeria. *KIU Journal of Social Sciences*, 4, 23-26.
- Ejumudo, K. B. O. (2013). Urban Development and Renewal in Nigeria: The Potency of Public- Private Partnership. *Urban Development*, 3(4).
- Enyia, C. D., & Emelah, G. E. (2023). Public-Private Partnership in Education and Sustainable Development in Nigeria. *Nigerian Academy of Management Journal*, 18(1), 116-120.
- Essia, U., & Yusuf, A. (2013). Public-Private-Partnership and Sustainable Development of Infrastructures in Nigeria. *Advances in Management and Applied Economics*, 3(6), 113.
- Fadeyi, O. I., Kehinde, O. J., Nwachukwu, C., Adegbuyi, A. A., & Agboola, O. O. (2018). Public private partnership for sustainable infrastructural development in Lagos metropolis: prospects and challenges. *Research and Science Today*, (1), 25.
- Fanzo, J., Shawar, Y. R., Shyam, T., Das, S., & Shiffman, J. (2021). Challenges to establish effective public-private partnerships to address malnutrition in all its forms. *International journal of health policy and management*, 10(12), 934.
- Gidigbi, M. O. (2023). Assessing the impact of poverty alleviation programs on poverty reduction in Nigeria: Selected programs. *Poverty & Public Policy*, 15(1), 76-97.
- Ibem, E. O. (2011). The contribution of Public-Private Partnerships (PPPs) to improving accessibility of low-income earners to housing in southern Nigeria. *Journal of Housing and the Built Environment*, 26, 201-217.
- Ibem, E. O., & Aduwo, E. B. (2012a). Public-private partnerships (PPPs) in housing provision in Ogun state, Nigeria: opportunities and challenges. In *Proceedings of 4th West Africa Built Environment Research (WABER) Conference, Abuja, Nigeria* (pp. 653-662).
- Ibem, E. O., & Aduwo, E. B. (2012b). Public-Private Partnerships (PPPs) in Urban Housing in Nigeria: Evidence from Ogun State. *International Journal of Architecture and urban development*, 2(2), 5-14.
- Jimoh, M. O., & Mustapha, R. (2020). Social Protection in Nigeria: An X-Ray of Social Investment Programme as a Panacea for Poverty Alleviation in Nigeria. *The International Journal of Business & Management*.
- Kadzere, C. T., et al. (2016). Unlocking Africa's agricultural development through public-private partnerships, supportive curricula and agriculture friendly policy.
- Kehinde, A. D., & Ogundeji, A. A. (2022). Social capital networks (SCNS) reducing the poverty on cocoa producing households: evidence from osun and ondo states of southwestern Nigeria. *Tropical and Subtropical Agroecosystems*, 25(2).
- Khan, S.A.R., Shah, A.S.A., Yu, Z. & Tanveer, M. (2022). A systematic literature review on circular economy practices: challenges, opportunities and future trends", *Journal of Entrepreneurship in Emerging Economies*, Vol. 14 No. 5, pp. 754-795.
- Klimanov, D. & Tretyak, O. (2019). Linking business model research and marketing: New network-based approach to business model analysis. *Journal of Business and Industrial Marketing*, 34(1), 117-136. doi:10.1108/IBIM-12-2017-0330.
- Kolawole, R. J. (2021). Evaluation of poverty alleviation programmes in Nigeria: The demand driven approach perspective. *International Journal of Development and Management Review*, 16(1), 161-177.
- Kraus, S., Breier M. and Dasí-Rodríguez S. (2020). The art of crafting a systematic literature review in entrepreneurship research. *International Entrepreneurship and Management Journal*, 16, 1023-1042.
- Kraus, S., Breier, M., Lim, W.M., Dabić, M., Kumar, S., Kanbach, D., Ferreira, J.J. (2022). Literature reviews as independent studies: guidelines for academic practice. *Review of Managerial Science*, 16(8), 2577-2595.
- Kraus, S., Mahto, R.V. and Walsh, S.T. (2023). The importance of literature reviews in small business and entrepreneurship research. *Journal of small business management*, 61(3), 1095-1106.
- Leigland, J. (2018). Public-private partnerships in developing countries: The emerging evidence-based critique. *The World Bank Research Observer*, 33(1), 103-134.
- Maslova, S. (2020). Achieving sustainable development goals through public private partnership: critical review and prospects. *International Journal of Innovation and Sustainable Development*, 14(3), 288-312.
- Mgbada, J. U., Ohajianya, D. O., & Nzeh, E. C. (2016). Sustainable agricultural practices and its determinants in South-east Nigeria. *Journal of Advanced Agricultural Technologies* Vol, 3(3).
- Monyei, F. E., Onyekwelu, P. N., Emmanuel, I. E., & Taiwo, O. S. (2023). Linking safety net schemes and poverty alleviation in Nigeria. *The International Journal of Community and Social Development*, 5(2), 187-202.
- Muhammad, Z., & Johar, F. (2019). Critical success factors of public-private partnership projects: a comparative analysis of the housing sector between Malaysia and Nigeria. *International Journal of Construction Management*, 19(3), 257-269.
- Njeru, P. N. (2017). An analysis of public-private-partnership in the provision of agricultural extension services: the case of greenhouse Tomato groups farming in Samburu county, Kenya (Doctoral dissertation, University of Nairobi).
- Ntagu, M. P., Nyam, V., & Promise, C. V. (2022). Policy of Agricultural Mechanization and Food Security in Nigeria: Challenges and Prospects. *KIU Journal of Social Sciences*, 8(1), 233-245.

- Nwoye, A. C. (2018). Africa and the Sustainable Development: The imperatives of Leadership, governance, citizenship, scholarship and empowerment. In International Conference on Economics of Sustainable Growth in Africa.
- Obayelu, A. E. (2018). Public-private partnerships for inclusive agribusiness sustainability in Africa. *Agriculturae Conspectus Scientificus*, 83(3), 251-261.
- Ojebode, A. J. (2016). Public-private partnership (PPP) as a mechanism for the provision of affordable housing delivery in Nigeria (Doctoral dissertation, University of Brighton).
- Ojelabi, R. A., Fagbenle, O. I., Afolabi, A. O., Tunji-Olayeni, P. F., & Amusan, L. M. (2018). Appraising the barriers to public-private partnership as a tool for sustainable development of infrastructures in a developing economy. In IOP Conference Series: Earth and Environmental Science (Vol. 146, No. 1, p. 012016). IOP Publishing.
- Ojong, F. E., & Anam, B. E. (2018). Agriculture promotion policy 2016-2020 and rural development in Nigeria: Challenges and prospects. *Journal of Humanities and Social Science*, 23(2), 24-29.
- Okwilagwe, O. O. (2017). Towards rethinking public-private partnership implementation: Insights from the nigerian context. In *The Emerald Handbook of Public-Private Partnerships in Developing and Emerging Economies: Perspectives on Public Policy, Entrepreneurship and Poverty* (pp. 465-487). Emerald Publishing Limited.
- Olaoye, J. O., & Rotimi, A. O. (2010). Measurement of agricultural mechanization index and analysis of agricultural productivity of farm settlements in Southwest Nigeria. *Agricultural Engineering International: CIGR Journal*, 12(1).
- Olatunji, S. O., Olawumi, T. O., & Ogunsemi, D. R. (2016). Demystifying issues regarding public private partnerships (PPP). *Journal of Economics and Sustainable Development*, 7(11).
- Olomola, A., & Adesugba, M. (2015). Transforming Nigerian agriculture in the context of a green economy: financing challenges, opportunities and mechanisms. *Nigerian Journal of Agricultural Economics*, 5(1), 1-11.
- Oloyede, B. B. (2014). Effect of poverty reduction programmes on economic development evidence from Nigeria. *Arabian Journal of Business and Management Review (OMAN Chapter)*, 4(1), 26.
- Oluwaseun, A. A. (2017). Public-Private Partnership for Growth and Poverty Reduction in Nigeria. *Proceeding Book*, 528.
- Onubuogu, G. C., & Esiobu, N. S. (2014). Policy Advocacy for Sustainable Agricultural Development Strategies: A Panacea for Green Economy Initiative in Imo State, Nigeria. *Policy*, 4(18).
- Opawole, A., Jagboro, G. O., Kajimo-Shakantu, K., & Olojede, B. O. (2019). Critical performance factors of public sector organizations in concession-based public-private partnership projects. *Property Management*, 37(1), 17-37.
- Oyewole, S. O., & Sennuga, S. O. (2020). Factors influencing sustainable agricultural practices among smallholder farmers in Ogun State of Nigeria. *Asian Journal of Advances in Agricultural Research*, 14(1), 17-24.
- Popoola, L., Saka, J., & Amusa, T. O. (2020). Prospects for public-private partnership in the Nigerian forestry sector. *African Journal of Rural Development*, 4(1), 125-140.
- Raidimi, E. N., & Kabiti, H. M. (2017). Agricultural extension, research, and development for increased food security: the need for public-private sector partnerships in South Africa. *South African Journal of Agricultural Extension*, 45(1), 49-63.
- Rankin, M., Nogales, E. G., Santacoloma, P., Mhlanga, N., & Rizzo, C. (2017). Public-Private Partnerships for Agricultural Transformation—Trends and Lessons from Developing Countries☆. In *The Emerald Handbook of Public-Private Partnerships in Developing and Emerging Economies* (pp. 191-219). Emerald Publishing Limited.
- Rehman, A, Tanzila, S, Muhammad, K, Suliman, M. F, Saeed, A. B, and Huma, C. (2022). "A Revisit of Internet of Things Technologies for Monitoring and Control Strategies in Smart Agriculture" *Agronomy* 12, no. 1:1<https://doi.org/10.3390/agronomy12010127>
- Richards, N. U. (2021). SDGs and private public partnerships in Nigeria. In *Implementing the Sustainable Development Goals in Nigeria* (pp. 152-166). Routledge.
- Richards, N. U. (2021). SDGs and private public partnerships in Nigeria. In *Implementing the Sustainable Development Goals in Nigeria* (pp. 152-166). Routledge.
- Sagagi, M. S. (2014). Public-Private Dialogue as a Panacea to Poor Governance and low Public- Private Partnerships in Nigeria. In *Public Private Partnerships* (pp. 83-98). Routledge India.
- Saha, C. (2019). Improving Food and Nutrition Security by Public-Private Partnership Rural Households (Doctoral dissertation, Maharaja Sayajirao University of Baroda (India)).
- Sanni, A, O. (2018). Public Private Partnership and the opportunities for infrastructural development in Sub-Saharan Africa. *Current Politics and Economics of Africa* 11, no. 1, 25-39.
- Senyolo, M. P., Long, T. B., & Omta, O. (2021). Enhancing the adoption of climate-smart technologies using public-private partnerships: lessons from the WEMA case in South Africa. *International Food and Agribusiness Management Review*, 24(5), 755-776.
- Smyth, S. J., Webb, S. R., & Phillips, P. W. (2021). The role of public-private partnerships in improving global food security. *Global Food Security*, 31, 100588.
- Thomas, A., Thomas, M. A. H., Turk, M. R. A., & Turk, R. (2023). Food insecurity in Nigeria: Food supply matters: Nigeria. *International Monetary Fund*.

- Tijani, H. O. (2015). Globalisation, institution and public private partnership: The Nigerian experience. *JL Pol'y & Globalization*, 43, 18.
- Trithara, D. (2016). Reshaping Global Governance Norms through Public-Private Partnerships: The Role Private Actors Play in Promoting African Food Security in the G8's New Alliance (Doctoral dissertation, University of Saskatchewan).
- Udoh, U. A. S., & Mbon, N. E. (2023). Industrialization And Public Private Partnership For Developing Domestic Economies In The Third World Countries Unwana-Abasi S. Udoh Ph. D. *Management*, 4(3).
- Ugwu, M. C., Adewusi, A. O., & Nwokolo, N. E. (2024). The Role of Public-Private Partnerships in Building Clean Energy Infrastructure in The United States and Nigeria. *International Journal of Management & Entrepreneurship Research*, 6(4), 1049-1068.
- Volleman, K. (2015). Combining stakeholders' strengths in the fight against food insecurity. Public- Private Partnerships as legitimate actors of Global Governance (Master's thesis).