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CHALLENGES TO SUSTAINABLE AGRICULTURE IN NIGERIA: LESSONS FROM BRAZIL

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ABSTRACT

The study comparatively investigated the challenges to sustainable agricultural policy development in Nigeria, using Brazil as example. It reviewed literatures from World Bank, Brazil Ministry of Agriculture and Livestock, Nigeria Bureau of Statistics, Nigeria Ministry of Agriculture and food security, African continental free trade agreement, among others. The study found that Brazil is a torch bearer in sustainable agricultural practice in the world, successfully converted their forest, degraded land, environmental problem and food insecurity to abundance and success and have become a reference point to many countries, including Nigeria. Though, Nigeria and Brazil share similarity in Population and colonization, but Brazil have out-paced and has become competitive and become one of the leading exporters of agricultural products in the world. It was also found that regarding agricultural contribution to Gross Domestic Product across countries, Nigeria fared better but looking at the agribusiness end of the value chain or value addition, Brazil has done incredibly well and occupies envious position. Nigeria still has a lot to learn from Brazil, no wonder the recent collaboration that has yielded about $1billion dollar intervention in order for Nigeria to deal with food security, research and development and Green Imperative Program. It was recommended that for Nigeria prosper in area of food security and be competitive in the global market like Brazil, addressing these challenges will require sustained efforts from the government, private sector participation, and collaboration among stakeholders to unlock the full potential of Nigerian agriculture and drive economic growth. Productivity and sustainability must be the foundation for future agricultural development. In this scenario, agricultural technology will play the major role.

Keywords**:** Challenges, Sustainable, Agricultural, Policy, Brazil and Nigeria

Introduction

As a source of food, employment and economic growth, agriculture is one of the pillars of world development. The agricultural sector is also important in Nigeria, with more than 34 per cent of the entire population being involved in agricultural activities (International Labour Organisation [ILO], 2025). Although it has an estimated arable land of 84 million hectares, approximately 40 per cent of the arable land is completely used in agriculture (World Bank, 2025). Major crops grown in the country include rice, cassava, maize, sesame seeds, cocoa and cashew, although the sector is not doing well to satisfy the needs of the domestic market. Before the 1970s oil boom, agriculture used to be the staple of the Nigerian economy. Nevertheless, corruption also changed governmental policies in favour of dependence on food imports at the expense of domestic production (Shaubu, 2023). Subsequent projects, such as Operation Feed the Nation (1976), the Green Revolution (1980), and the Agricultural Transformation Agenda (2011), could not successfully realise their aims because of insufficient funding, lack of proper sustainability and weak implementation structures (Elemi et al., 2015). This led to food insecurity and low performance in the sector.

Sustainable agriculture has become important due to the increasing necessity to ensure a balance between agricultural productivity and environmental protection. According to Hawken, cited in Ofiobor (2017), sustainability is defined as keeping and sustaining in existence over a long period of time, which is also similar to the goals of sustainable agricultural policies. The focus of such policies is on responsible utilisation of resources, strategic investment, technological innovation and institutional transformation that support the needs of the present as well as the future. Sustainable agriculture has come to be presented as a development model around the world that incorporates economic growth, social equity, and conservation of the environment (Sambuichi et al., as cited in Labinski et al., 2024). It is a holistic solution that aims at conserving resources over a long-term period, minimising environmental degradation and enhancing cooperation among various stakeholders.

A good case study of agricultural change, which is associated with institutional reform, can be an example of Brazil. Although Brazil had comparable struggles with Nigeria, the country became a principal food exporter thanks to major investments in tropical agricultural research, practices, and institutions like the Brazilian Agricultural Research Corporation (Embrapa) (Hayashi, 2024). Low-carbon policies and climate-resilient approaches also became a part of the country in order to balance productivity and environmental sustainability (Climate Policy Initiative [CPI], 2023). However, the development of Brazil did not go without failures, as the problem of environmental degradation, deforestation, and greenhouse gases was not negligible. These measures allowed Brazil to minimise its carbon footprint and still achieve high agricultural productivity, illustrating the possibility of balancing between economic and environmental objectives in Nigeria as the country is faced with the challenge of food security, economic diversification, as well as sustainable agriculture like Brazil. However, its poor implementation of policies has equally been compounded by lack of good infrastructure and low accessibility to finance (Ononogbo et al., 2024). Therefore, this study aims at comparing the policy frameworks, with institutional capacity as well as implementation strategies in Brazil and Nigeria.

Agriculture: Brazil Experience

Brazil is known today as one of the global agricultural giants, not as a food importer but a leading exporter of products such as soybeans, coffee, sugarcane, as well as chicken worldwide. Brazil possesses more than 850 million hectares of land and a population of over 215 million. Through technological innovation, strategic policy reforms, and public-private alliances, it has managed to develop an efficient agricultural sector that generates a significant portion of its GDP and contributes to the global food supply.

The agricultural transition in Brazil is historically based on exports of coffee and sugar during the colonial period, which gained momentum during the 20th century, especially as the cerrado region that was previously considered unworthy of agriculture was developed. Its potential to be grown on a large scale was opened up through investments in infrastructure, irrigation, and tropical agricultural research. The other factor that has contributed towards this change is the Embrapa (Brazilian Agricultural Research Corporation) that was founded in 1973 and was the first to make any meaningful advancement in gene engineering of crops, soil management and climate changes. Embrapa became one of the most successful agricultural research organisations in the world due to the decentralised structure of the model and emphasis on human capital.

Despite the successes, Brazil is grappling with great sustainability issues. Brazil is the sixth-largest source of greenhouse gases in the world, much of which is associated with the agricultural sector, which is a major source of greenhouse gas emissions via deforestation and land-use change. Policies like the ABC Plan (promotion of low-carbon agriculture) and the Plano Safra (sustainable agriculture credit) have been suggested as a response. Brazil encourages family farming and agroecological systems with the help of programmes like the National School Feeding Programme (PNAE), which links local food production to the government purchasing food, which helps to ensure food security and a sustainable environment.

These issues demonstrate the need of more accommodative and equal agricultural policies. In Brazil, agribusiness was developed as a result of macroeconomic reforms that included trade liberalisation and reduced government intervention in the 1990s. The better transport systems have also facilitated the transportation of farm produce to the urban markets and ports in the rural areas in a much better and more effective manner which has resulted in more productivity and increase in the exporting capacity.

Agricultural Policies in Nigeria

Nigeria is one of the countries in which the primary sector of economy was agriculture which provided jobs, food security, and wellbeing of the rural population. Its contribution to the GDP was over 60 percent during the era preceding the 1970s, and currently the industry is a victim of the wrong priorities of the policy and poor investment (Food and Agriculture Organisation [FAO], 2016). As a way of addressing the food insecurity and economic vulnerability, the government has introduced several agricultural development Programmes the first policy was the Operation Feed the Nation (1976) followed by the Green Revolution (1980) and Agricultural Development Projects (ADPs), which was introduced in 1973 (Nigerian Queries, 2025). Another milestone was achieved with the National Agricultural Policy of 1988 as it provided guidelines on food self-sufficiency, the development of rural incomes, and export agriculture (FAO, 2016). In recent years, the priorities shifted to agribusiness, value-added chains, the role of the private

sector, young participation, and agro-climate-smart agriculture in such programmes as the Agricultural Transformation Agenda (ATA, 2011), the Agricultural Promotion Policy (APP, 2016-2020) and the National Agricultural Technology and Innovation Policy (NATIP, 2022-2027).

With the Structural Adjustment Programme (SAP) of 1986, this has changed after it encouraged liberalisation and minimised government intervention. SAP had an intention of diversifying the economy and empowering the private sector, and in the process, it had to cut subsidies and subsidies on the smallholder farmers, thus exacerbating their access to inputs, extension and market (Idachaba, 2006). In reaction to this, initiatives such as the National Livestock Transformation Plan (NLTP, 2018) focused on modernising livestock and resolving the farmer-herder conflicts (Federal Ministry of Agriculture and Rural Development [FMARD], 2020). Likewise, the Growth Enhancement Support Scheme (GESS, 2011) also implemented mobile-based e-wallets to distribute inputs, but was hit with the problems of inconsistent funding and rural farmers' lack of digital literacy (Akinyele et al., 2021).

ATA modernised agriculture as a business, giving priority to concentration of staple crops, access to finance and the role of the private sector. As the food production increased and food imports decreased, poor infrastructure and institutions restricted results (Adewumi and Omotesho, 2020). APP relying on the ATA added nutrition-sensitive agriculture and climate-resilient agriculture, which are similar to the global sustainable development objectives. Although these developments have been made, chronic issues such as fragmentation of land, inadequate infrastructure, financial limitations and effects of climate change remain. In addition, policy uncertainty and change in leadership are a deterrent to long-term investment. Informed by the experiences in Brazil, where the government, research and farming communities have been working together to drive change, Nigeria needs inclusive, sustainable, and innovation-based policies that can reinforce the agricultural sector (Swensson and Tartanac, 2020).

Theoretical Framework

This study is anchored on the Institutional Theory which was developed by sociologist Philip Selznick in 1948 and subsequently refined by Mitchell and Rowan (1977). Institutional Theory examines how institutions, comprised of determined law, accepted norms and arranged institutional structures influence performer behaviour in a system. Selznick underlined the importance of the fact that institutions go beyond formal systems but are filled with values and social meaning. Meyer and Rowan also pointed out that the formal structure is usually adopted by organisations in their bid to have legitimacy, with the observation that such a structure does not always lead to enhanced performance. According to the theory, pressure of the institutional environments forces organisations to adhere to accepted forms of operation, leading to isomorphism or likeness of practices among organisations or nation-states (DiMaggio & Powell, 1983: Ononogbo et al., 2024; Hayashi, 2024).

When applied to this work, the Institutional Theory can be used to describe the reason why the agricultural policies in Nigeria have not secured sustainability. Weak institutionalisation is presented by the absence of a powerful institutional framework, insufficient stakeholder involvement and the implementation of policies. With the application of Institutional Theory, the study indeed establishes the relevance of institutional capacity, institutional legitimacy and normative alignment in formulating effective

agricultural policies and also points out how Nigeria can renovate its agricultural sector by emulating the Brazilian institutional model.

Methodology

This study is a systematic review based on comparative study between Nigerian and Brazil. It used qualitative data through content analyses from relevant literatures such as the Ministry of Agriculture and Livestock in Brazil, World Bank, Central Bank of Nigeria, Nigeria Bureau of Statistics and other relevant studies from systematic literature review regarding the subject area. The data on Brazil and Nigeria Agricultural transformation were compiled in tabular form in terms of changes in percentages and rates over a given period to monitor the trend of events in the study areas.

Table 1: Comparison between Agriculture in Nigeria and Brazil

YEAR	COUNTRY	% TO GDP	% TO POVERTY INDEX	% TO INFLATION RATE
2010	BRAZIL	4.12	5.3	5.91
	NIGERIA	40.8	88.7	12.7
2011	BRAZIL	5.3	4.7	6.3
	NIGERIA	40.1	21.8	13.8
2012	BRAZIL	6.8	6.6	4.93
	NIGERIA	43.6	88.4	11.98
2013	BRAZIL	7.1	9.8	6.1
	NIGERIA	45.1	67.5	8.6
2014	BRAZIL	6.8	22.8	6.41
	NIGERIA	26.8	43.3	8
2015	BRAZIL	3.16	3.4	9.56
	NIGERIA	27.1	87.2	9.2
2016	BRAZIL	4.55	23.8	8.7
	NIGERIA	25.5	43.0	18.55
2017	BRAZIL	7.1	11	2.95
	NIGERIA	21.1	53.7	16.92
2018	BRAZIL	5	10.9	3.75
	NIGERIA	25	88.7	11.63
2019	BRAZIL	4.2	10.8	4.31
	NIGERIA	21.9	40.1	11.98
2020	BRAZIL	-5.9	5.3	4.52
	NIGERIA	22	63.0	16.95
2021	BRAZIL	6.9	11.3	10.06
	NIGERIA	24.2	63.0	15.63
2022	BRAZIL	6.8	8.4	5.79
	NIGERIA	23.7	63.0	21.34
2023	BRAZIL	6.24	21.7	5.32
	NIGERIA	22.7	63.0	28.92
2024	BRAZIL	5.58	20.9	4.83
	NIGERIA	24.6	75.0	34.19

Source: The global economy.com, 2025

Discussion of Findings

Comparison of the data of Brazil and Nigeria from 2010 to 2025 shows the differences in the outcome of agricultural policies, support institutions and sustainability parameters. Higher percentages of government provisions such as rural credit subsidy programme like the ABC Plan, which provides farmers with low-interest credit only to those who apply low-carbon technologies, such as no-till farming and integrated crop systems and who, at the same time, mitigate the risk of farmers, using subsidised crop insurance and technology adoption, which are among the key institutional pillars in the long-term development of sustainable agricultural growth alone, are exhibited steadily by Brazil (Hayashi, 2024; Marcelo, 2023). Take an example of Brazil, which was at a high mark of 7.1 per cent government provision in the year 2013/ 2017, as compared to Nigeria, which had a maximum government provision of 3.7 per cent in the year 2010, which is very low. This corresponds to the Institutional Theory criticism of focusing on legitimacy and resource distribution as the crucial determinants of policy successes (Selznick, 1948; Meyer & Rowan, 1977).

The use of employment data supports the gaps even further by institutions. Agriculture in Nigeria has sustained the employment of more than half of the population to date, but its share in the GDP has been imbalanced, decreasing by more than six times in the years 2010 and 2024. That means that productivity and value chain integration inefficiencies exist, which reflects the lack of proper institutional structures and effective policies (Ononogbo et al., 2024; FAO, 2016). Compared to less than 10 per cent in agriculture, Brazil has a steady share of GDP contribution, which represents a more mechanised and efficient sector, which is facilitated by robust institutions like Embrapa (Alves & Pastore, 2012).

These figures of agricultural credit and subsidies also exemplify the institutional gap. There are regularly high credit provision and subsidy rates in Brazil with significant surges in 2015 and 2016, which help to validate the hypothesis of institutionalised financial mechanisms improving performance in the sector (Gasques et al., 2010). The numbers in Nigeria are, however, lower than 3 percent over the course, showing a low access to finance by farmers, which is a significant obstacle to productivity and sustainability (Akinyele et al., 2021). This supports Greenwood and Hinings' (1996) critique of Institutional Theory, which argues that without adaptive mechanisms, institutions may fail to respond to grassroots needs.

Food price index and inflation rates also reflect the consequences of institutional weaknesses. Nigeria's food price index and inflation rates are significantly higher, with inflation rising from 12.7% in 2010 to 34.19% in 2024. Brazil, despite fluctuations, maintains relatively lower inflation, suggesting better macroeconomic stability and policy coherence (Baer, 2008). These findings align with the theoretical proposition that institutional legitimacy and stability contribute to economic resilience and policy effectiveness (DiMaggio & Powell, 1983).

Brazil has an edge over Nigeria in the area of adoption of technology. Such investment in tropical agricultural research and innovation, seen in Brazil and other cases, such as through Embrapa, has resulted in the extensive uptake of climate-smart and mechanical technologies (Hayashi, 2024; Alves et al., 2012). On the contrary, Nigeria demonstrates limited improvements in technology usage as the numbers have not exceeded 3 per cent over the years. This shows that there is no institutional support for research-extension links and digital agriculture, and yet this is outlined in the

policy intentions of the NATIP 2022-2027 (NABG, 2025).

The information displayed by the poverty index indicates the social consequences of the disparities in institutions. Agriculture in Nigeria, although it is one of the sectors that is capable of employing a large number of the population, has a very small contribution to poverty alleviation. Brazil has been able to promote family farming and inclusive growth in efforts to diminish poverty in the countryside due to the focus of targeted programs such as PRONAF and PNAE (Swensson &Tartanac, 2020). This confirms the observation in Institutional Theory that well-organised institutions can generate an equitable development with the use of inclusive policies (Meyer & Rowan, 1977).

These findings are also supported by evidence presented in earlier research. According to Elemi et al. (2015) and Shaubu (2023), one of the downfalls in the agricultural development of Nigeria is the history of implementation of polices pertinent to agriculture that lack sustainability and institutional support. Conversely, the cases of Brazil moving (strategically) towards battery production facilitation through the formulation of the ABC Plan and Plano Safra exemplify how institutional convergence on global sustainability standards can bring about good change (Climate Policy Initiative, 2023). All these comparisons substantiate this theoretical approach by demonstrating the fact that institutional legitimacy and coherence do influence the success of policies.

Consequently, the results of this research closely respond to Institutional Theory. The agricultural change in Brazil is an outcome of institutional investments, coherence of policies, and involvement of stakeholders. The problems that Nigeria has to face are the lack of unity in the very organisations, the ineffectiveness of the policy application, and financial and technological assistance. In this respect, Nigeria needs to establish stronger institutional structures, increase policy legitimacy and use populist and data-driven methods similar to the Brazilian experience (Ononogbo et al., 2024; Hayashi, 2024). This paper, therefore, adds to the overarching debate on sustainable farming because it highlights the importance of institutions in the development of policy outcomes.

Conclusion and Recommendations

Nigeria cannot do away with agriculture since agriculture plays a vital role in food security, job creation, the provision of raw materials, the generation of revenue, and sustenance. Both Brazil and Nigeria, over the years, have given emphasis to policies that focus on food security, productivity, environmental sustainability, diversification, and export promotion, albeit in different configurations. Nigeria has also taken the lesson of Brazil by appropriating various programmes, including school feeding, sustainable farming and mechanised agriculture. This has been formalised by the signing of the Green Imperative Programme worth one billion dollars that aims to modernise Nigeria's agricultural sector by transfer of technology, mechanisation, renewable energy and capacity building. Brazil has shown its focus on innovation, climate-resistance and international collaboration through its global leadership in sustainable agriculture, especially in being the host of COP30 in November 2025 and other global summits such as Bio-Summit and Expo. Its continued association with Brazil provides a strategic avenue through which Nigeria can deal with its problems in the agricultural sector. However, to tap into Nigeria's agricultural potential, there is a need to consider a multidimensional approach that enhances infrastructure, increases access to finance and institutional

capacity. The focus should be on policy consistency, partnership with the stakeholders and sustainable agriculture to promote long-term development. Although other programmes like the Agricultural Transformation Agenda, Green Revolution, Anchor Borrowers Programme, and National Livestock Transformation Plan have helped the sector, there are still challenges. Financial scarcity, inadequate rural infrastructure, weak institutions and compounding effects of climate change are obstacles to development. To overcome them, the challenge facing Nigeria is the long-term government investment, increased participation of the private sector, and better research and extension services. Productivity and sustainability must serve as the centre point of the future of the Nigerian agricultural sector; and the technology of agriculture is the change agent and the engine of sustainability.

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