INOSR Experimental Sciences 13(1):31-37, 2024.
©INOSR PUBLICATIONS
International Network Organization for Scientific Research
https://doi.org/10.59298/INOSRES/2024/1.31.3710

ISSN: 2705-1692
INOSRES1.31.3710

Fostering Food Security through Enhanced Fertilizer Production: Examining Policy Frameworks

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ABSTRACT

Agriculture is an important tool in poverty alleviation especially in rural areas whose economy mainly relies on agriculture as a source of income. Nevertheless, Nigeria is to face the food security crisis due to its agriculture sector which it heavily depends, but food consumption is imported rather than self-produced. Projections indicate that by 2030 Nigeria's population will double the 2006 estimation which necessitates increased food production to meet the growing and urbanizing population needs and to open possibilities of exports. Apart from this, the country is faced with soil degradation as a result of inappropriate agricultural practices; erosion and gully, deforestation as well as climate change. It endangers the once dominant subsistent farm economy. The problems rose above show that there is an urgent need to review the role of fertilizers in food production for better food security. Proper execution of fertilizer policies becomes a powerful tool towards increasing agricultural production, malnutrition reduction and poverty alleviation through lowering food prices. Nevertheless, demand and supply factors like low farmers' incomes, high market prices due the limited availability of fertilizer and public policy response also known as price incentives influence the low usage of fertilizers in Nigeria. In view of above problems, there is an urgent need to have a more holistic approach to sustainably raise agricultural productivity in Nigeria with a view to averting food shortage.

Keywords: Food security, Fertilizer production, Agricultural productivity, Poverty alleviation, Policy frameworks

INTRODUCTION

Nigeria agriculture and economic development exhibits paradoxical nature. Although Nigeria has huge potential to diversify its oil-dependent economy through agricultural development, agricultural sector still contributes about 40 per cent of GDP and 90% of non – oil exports [1, 2]. Agriculture is still a very effective avenue of poverty alleviation especially for the rural farm families as a good percentage of the population still earns the greater proportion of their income from agriculture [3 - 6]. Agriculture sector besides is another employer, that is more than 70% of the population, consisting mainly of small-scale farm holders [7]. But Nigeria faces a food security crisis although being the most popular agricultural producer in Africa; a growing population is mostly depending on importing food products [8]. Projecting that by the year 2030, Nigeria's population will double the 2006 estimate, increasing food production will be required to feed a growing and urbanizing population and to capitalize on potential export opportunities [9]. Issues like insecure land tenancy, limited access to funds and credit, labor shortage despite high unemployment rates, and stagnant technology constitute the hindrances to the nation's agricultural development. Considering the constraints on land expansion, there is a need for optimal use of science-based agricultural inputs to improve agricultural production [10, 3].

The Nigerian soil fertility and nutrient depletion is declining posing challenges to the recent growth of its agriculture Farmlands degradation arising as a result of the damages caused by wrong agricultural practices, erosion, deforestation among others, further complicates the issue [8]. This decay undermines the once large-scale subsistence-oriented farm economy putting it at risk of being marginalized. Low fertilizer use in Africa contrasts with regions such as West Europe and Asia which is attributed to weak agricultural productivity growth [12]. The amount of fertilizer per hectare, at 13kg/ha, applied in Nigeria, is very low for achieving agricultural growth, poverty eradication

and environmental sustainability objectives. Sub-Saharan Africa have the same problems, since use of fertilizers not enough to replenish those nutrients that are lost during harvesting [13]. Some of the government efforts in addressing the issues have achieved little success [14]. Policy interventions targeted at increasing agricultural productivity in Sub-Saharan Africa must take a holistic view covering innovations, modern production approaches, and optimal use of fertilizer and seed [15]. Particularly, fertilizer is a key input to improve crop yield and productivity [12, 11, 17]. The differences in fertilizer use between Africa and other developing regions evince the need for specific policies and programs to tap the benefits of fertilizer usage [18]. The purpose of this paper is to determine the need for intensifying fertilizer production to advance food security.

Implementation of fertilizer policies, as an effective measure, can bring about higher agricultural productivity, food security, and growth with high poverty reduction effects [19]. The policy reforms which include privatization and liberalization had been introduced in order to maximize subsidies benefits and promote agricultural development. The core objective of this policy, address the immediate food security issues while make long-term investments improve productivity. Nevertheless, the main constraints for smallholder farmers are still the poor soil, small land, low productivity and population growth causing pressure on natural resources [20]. Fertilizer use is still below the recommended limit including FAO and 2006 Abuja Declaration goal of 200kg per hectare. Population growth and economic development are the main factors which are pushing for the need for more food production and fertilizers use. [21] insisted on boosting food production by adopting modern technology as population pressure increases. The evolving population challenges require the use of newly emerging technologies and the intensification of the agricultural systems. Hence, those challenges call for agriculture intensification through new technologies adoption.

The important role played by new technologies and innovations in addressing global food security challenges is widely recognized Governments globally appreciate that the development of food production is unequivocally a precondition for economic growth and development, more so in the developing countries. In their part, Nigeria has adopted a lot of policy tools in the past to improve fertilizer utilization and productivity. The structure of Nigeria's fertilizer policy and market has undergone evolution with successive governments using different instruments to create demand stimulate and ensure availability. Government supported programs to lower fertilizer prices for farmers and managing procurement and distribution programs have been main tactics [18]. In spite of these efforts, low fertilizer uptake still exists among small scale farmers in Nigeria leading to low productivity and poor farm income. The different policy approaches by the government have not fully overcome these challenges; hence, the need for another intervention and more creative ways to boost agricultural production and livelihoods.

Fertilizer Policy in Nigeria

Most of the low utilization of fertilizer in Nigeria in related to demand and supply factors like low farmer incomes, limited fertilizer availability and high market prices. Yet, fertilizer-linked issues, in turn, have also brought public policies to the forefront, leading to the persisting use gap problem. Many policy approaches have been adapted to promote uptake of fertilizer use in smallholder farm systems in Nigeria [22]. Measures include strengthening monopoly of fertilizer importation and distribution by the state, price controls and subsidies as well as credit to farmers through markets, instituting import duties, decentralizing purchases and redistribution as well as market deregulation. However, the constant change in fertilizer policies and the encouragement of a dual fertilizer market (subsidized and free market) limited the private sector's ability to take the role played the public sector in. delayed products quality, arbitrage, and delayed distribution are the persistent problems through the whole period notwithstanding these policy interventions. Despite numerous changes in fertilizer policies at both the federal and state levels in Nigeria over the years, one aspect has remained consistent: the use of fertilizing price discounts. The subsidy has been a fulcrum of Nigeria's fertilizer policy and this can be premised on diverse perspectives ranging from remedying market imperfections and fostering equity. In a competitive market, subsidies tend to generate distortions and economic inefficiencies, causing net welfare deterioration. Hence, in Nigeria and other developing countries with the absence of competitive market conditions, public intervention is viewed as necessary [23]. Also, subsidies could be considered as an equity issue as they help to reduce income inequality. While debates continue to rage about continued use of subsidy for equity in circulation and the role of subsidy to reduction of farm gate prices as well as the boosting of the effective demand of fertilizer among smallholder farmers. There are important and persistent defects in fertilizer production in Nigeria, more particularly

since local manufacture is rather low. In the 1990s, subsidies have been a major contributor to the diffusion of and increased area under maize seed increase fertilizer technology [24]. Likewise, Malawi is a success case of transitioning from being a food aid-dependent economy to an exporter after giving vouchers for subsidized seeds and fertilizers to the small-scale producers.

Nevertheless, the heavy reliance on pricing subsidy compared to other approaches like better farmers' fertilizer management techniques through extension programs, lower transaction costs through enhanced regulatory environment and fertilizer quality control have limited the development of the market in Nigeria [25]. One of the elements of the Comprehensive Africa Agriculture Development Program (CAADP) in 2006 which African leaders including Nigeria signed up to, was to improve fertilizer use to meet the continent's green revolution target. Evidently, the Nigerian Government saw direct procurement of fertiliser as a thing of past and the Nigerian government initiated a fertiliser voucher scheme in selected localities to be an alternative to subsidy. However, ensuring subsidies get to the right people comes with some benefits; this potential still remains negotiable in Nigeria. The critics assert that the opportunity cost of investment in infrastructure development, crop science technologies, extension services, management systems, production, and financial market development would give more returns than fertilizer subsidies for the smallholder farmers. Pivotal matters under discussion in this debate are firstly how the government can successfully employ subsidies to smallholder farmers, secondly the needed investments to enhance the ability of farmers to benefit from subsidy programs and thirdly the role that the existing private sector network plays in efficiently delivering the subsidies to the farmers.

Issues Confronting the Sector

Several things can explain the underperformance of the sector as well as weak farmer's fertilizer application. These include factors that:

• affect the agronomic potential for fertilizer application;

• transform potential into actual demand of farmers for fertilizers;

• to find the development of fertilizer supply; and build up the fertilizer distribution system [26].

Quality assurance in fertilizer production is firstly given priorities by the policymakers given its significant role in agronomic response that impacts on the intensity and profitability of fertilizer utilization. Despite the national fertilizer policy in Nigeria that urges regulation of quality of both imported and locally produced fertilizers, the public sector institutions grappled with issues of quality. Adulterated, misbranded fertilizers, counterfeits and underweight bags filled with soil are commonplace in the Nigerian market, highlighting the severity of the quality challenge [27]. Next, demand for fertilizer, like any other agricultural input, is conditional since it largely depends on the expected returns that are influenced chiefly in the way price responds to market demand and supply. Agricultural prices are paramount signposts to farmers in regard to resource allocation. Nonetheless, some species of fertilizers are the cause of policy dilemma given their inherent properties. Contrarily, despite the fact that fertilizers are divisible and theoretically should diffuse rapidly among smallholder farmers under equilibrium conditions of agronomic responses and price ratios the situation in reality is the opposite. Fertilizer-related expenses make up a large component of production-dependent cash expenses, placing farmers at financial risk in comparison to costs of hybrid seeds. Even after adoption, selection of the most appropriate fertilizer types and application rates remains a big problem for agricultural research system owing to complex needs for information [28].

The transmission of price signals becomes difficult without sound communications and transportation infrastructure and weakly built market-supporting institutions. This situation increases marketing risks and expenses which then relatively lead to low fertilizer usage. Supply issues create worries as well in this regard, especially the past extensive relying on external source mainly due to large financial input to imports and high local prices. In the late 1980s and mid-1990s, bulk of supply was domestic production which ranged between 46 and 60 percent of the total supply. The situation was aggravated in the early 2000s as all the NPK fertilizers are imported since the National Fertilizer Company of Nigeria (NAFCON), the sole producing unit, was closed down for repairs. The Federal Market Stabilization Program (FMSC) was central in Nigeria's fertilizer policy receiving a 43 percent of total agricultural capital spending in 2001-2005. The program gave the budgetary support for the fertilizer imports. Moreover, an overvalued currency for most of the post-1980 period rendered the domestic production unprofitable. In addition, limited domestic supplies of organic manure plus a mobile livestock industry which is distinct from crop agriculture made predominant biomass sources uneconomical with imported inorganic fertilizer. In addition, agroforestry techniques remained largely underused. The voucher

system was introduced as an alternative model to the government-funded fertilizer subsidy program, the goal was to address deadlocks in access to fertilizer and to ensure that the subsidies went to people that were supposed to receive them. The system is based on an effective private agro-input dealer network which concurs with what is in the Abuja Declaration.

Politics of Fertilizer Policy Implementation

The challenges energy-tools assessment endeavours face emanate from the political and economic dynamics that attends fertilizers and agricultural inputs demand and supply. Despite government efforts to increase smallholder farmers' productivity through fertilizer adoption and intensified usage policies, limited success has been achieved in converting these efforts into sustained agricultural production, improved rural household income and livelihoods [27]. The government initiatives and programs fail to reach many smallholders since they are poorly implemented and incorrectly target them, mainly in fertilizer policy [28]. A number of authors have underscored the high cost of government spending on fertilizer subsidies [29, 18, 30]. In the same vein, subsidized fertilizers find their way into the hands of the private sector who later marks them exorbitantly and sell them to the small holder farmers at a higher cost or exported through diverse means of channels to the neighbouring country hence resulting into its inadequacies and little availability to the smallholders. The above mentioned challenges highlight the inefficiency and ineffectiveness in the implementation of the fertilizer policy in Nigeria, therefore pointing towards the need of reforms to ensure that subsidies reach the targeted beneficiaries and fulfill their purpose of increasing agricultural productivity and uplifting rural livelihoods.

The transfer of subsidized fertilizer from the public to the private sector poses serious risks which can easily derail government efforts. . Nevertheless, the overall fertilizer use is increased more on average when fertilizers subsidy is administered especially in areas where the private sector has not been functioning and when carried out with the small family holder farmers who cannot afford fertilizers at market prices [31]. Historically, fertilizer policy in Nigeria has gone from state involvement in procurement and distribution to central control in the early 1980s [32]. The Federal Market Stabilisation Program (FMSP) emphasised direct government procurement and distribution by state governments of subsidised fertiliser, with little participation of the private sector [27]. Nevertheless, the realization of structural adjustment programs in the late 1980s made private sector own, buy, and sell fertilizer in the 1990s. The private sector's failure to meet fertilizer demand necessitated government to bring back the fertilizer subsidy programmes and re-join the fertilizer market. The government from 2001 has covered various subsidy levels, starting from 35-41% to about 50% via initiatives such as the Growth Enhancement Scheme and the Agricultural Transformation Agenda [33].

The recent policies and programs, for instance, the Agricultural Transformation Agenda (ATA) and the Agricultural Promotion Policy (APP), have become the policies and programs with a focus to build on the successes of the past by use of approaches like mobile phone technology vouchers and agribusiness practices [8]. However, politics that underlie adjustments made to fertilizer policy architecture is a critical factor in the overall realization of these interventions. The relations and power balances regarding stakeholders such as federal and state governments, international donors and NGOs, agriculture ministers, relevant institutions, Fertilizer Development Program (FDP), and fertilizer companies need further exploration for successful delivery and evaluation. Real-time monitoring and evaluation are key in the smooth distribution of subsidized fertilizer, which goes to show the magnitude of a functioning monitoring and evaluation department in fertilizer policy implementation.

Governance and Nigeria Fertilizer Policy and Its Implementation

The governance issue has been reiterated as an essential element influencing Africa's economic development [34]. The importance of good governance by recent development policy discussions have been highly valued more in the time [35]. This emphasis of governance has two major development approaches as its roots. For starters, there is emphasis on the creation of impersonal and impartial institutions that help in protecting property rights and contracts resulting in market exchange, investments and innovations [35]. Namely, more and more development initiatives are considered to be ineffective not depending on government policies only but on the character of governance as well [26]. Studies have looked at various aspects of governance with a view to development. [37] in-depth analyzed the relationship between governance, economic growth and inequality; while [38] investigated the importance of governance and its mechanisms. [39] Studied in depth different governance mechanisms and their effect on human development, and [40] presented how democratic governance influences economic growth through various channels. [41]

Underscored the role of citizens' access to governance mechanisms in the process of development, and [42] examined the relations between democratic governance, distribution and welfare. The studies show that discriminatory governance mechanisms can act as brakes to development the results of these studies consistently demonstrate [34, 35]. The African Economic Research Consortium (AERC) underscored the centrality of good governance in economic growth and argued that bad governance generates policy syndromes that impede growth, while good governance creates regimes that are free from policy syndromes [34]. The indicators including government effectiveness, political stability and instability, control of corruption and regulatory quality significantly determine the country's performance [34], good governance is associated with higher per capita GDP levels and sustained growth rates over time. This underlines the importance of effective governance both for its own sake but also for its possible contribution to a country's economic performance.

CONCLUSION

Although Nigeria's fertilizer policy landscape is undergoing transformations, the one constant feature there has been is reliance on subsidized fertilizer. Yet, despite this justification of subsidies by such grounds as addressing market failures and equity concerns; these have largely not been met. The heavy concentration on input subsidization while neglecting other alternative approaches such as adaptation of improved fertilizer application techniques through extension programs and establishment of favorable policy and market regulation environments aimed at reducing cost and eliminating risks has delayed market development. Government in Nigeria should depoliticize economic policies and improve governance structures which will strengthen monitoring and evaluation mechanisms of policies, programs and activities. For Nigerian agriculture to be productively sustainable in the long term, a more holistic approach is a must.

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CITE AS: Ugwu, Chinyere Nneoma and Okon, Michael Ben (2024). Fostering Food Security through Enhanced Fertilizer Production: Examining Policy Frameworks. INOSR Experimental Sciences 13(1):31-37. https://doi.org/10.59298/INOSRES/2024/1.31.3710