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Impact of Agripreneurship Practices on Food Security and Economic Transformation among Small and Medium Scale Farmers in Bauchi Metropolis, Bauchi State, Nigeria

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Abstract
The study investigated the impact of Agripreneurship practices on food security and economic transformation among small and medium scale farmers in Bauchi metropolis, Bauchi state, Nigeria. The study was guided by three objectives, research questions and null hypotheses respectfully. The study adopted Descriptive survey research design. The population for the study was 215 registered small and medium scale farmers. The study employed the use of census sampling technique; hence, total population sample was used in the study, where only 176 responses were recorded. The instrument used for data collection was a structured questionnaire. The instrument was subjected to face and content validation by two experts. In order to find out the reliability of the instrument, a pilot study was conducted. From the result, 0.78 Cronbach Alpha coefficient was obtained, which is reliable. The researchers and two trained research assistants collected the data. Data collected from the study was analyzed using mean, standard deviation and simple linear regression analysis to answer the research questions and also, to test the null hypotheses at 0.05 level of significance. The findings revealed that organic farming, agricultural biotechnology and food processing have significant influence on food security and economic transformation among small and medium scale farmers in Bauchi metropolis. The study therefore concluded that, Agripreneurship practices such as organic farming, agricultural biotechnology and food processing by small and medium scale farmers led to increased food availability and quality and above all, farmers economic growth through increased income. It was recommended that Bauchi state government through its Agricultural Development Programme (ADP) and Bauchi State Agricultural Cooperatives (BASAC) should provide basic training on organic farming, agricultural biotechnology, and modern food processing as well as policy support, especially on tax, cost of farming and provide easy access to finance by the farmers.

Key words; **Agripreneurship, Practices, Food Security, Economic Transformation**

Introduction

Bauchi state of Nigeria is an agrarian economy with abundant availability of land for agricultural activities and a vast population depends on agriculture and its allied activities. In the past, agriculture was seen as a low technology driven industry dominated by numerous small family firm, whose main focus is on doing things better rather than doing new things. However, due to the economic liberalization and fast changing economy, this situation has changed drastically. Now agricultural companies have to adapt to the varied demands of the market, food safety measures, strict environmental regulations among others. These circumstances have opened the channel for new entrants, innovation and portfolios entrepreneurs.

Agripreneurship is a concept that is specific to agriculture and drawn from wider entrepreneurship, and it has prospective and potentials for the social and economic development of the country (Sontakey, 2024). According to Sontakey (2024), its contribution takes the form of employment creation and economic growth, diversified income and poverty reduction in rural areas and improvement in nutrition, health and overall food security. According to Kukday (2024), Agripreneurship encompasses the transformation of an idea or vision into a "new business or new venture creation or the expansion of an existing business by an individual or a team of individuals, or an established business".

In addition, Macher in Kukday (2024) define Agripreneurship as a profitable marriage of agriculture and entrepreneurship, more plainly, turning farm into a business. Agripreneurship is the dynamic and systematic endeavor that serve consumers globally and locally through innovation and management of multiple value chains that deliver valued goods and services derived from sustainable orchestration of foods, fibers and natural resources. It is the combination of agriculture and entrepreneurship that encompasses all business activities that involved agricultural production, processing, inputs, supply chain and marketing of agricultural commodities.

The important of Agripreneurship to human cannot be over emphasized, because it is the sum of all operations involved in the manufacture and distribution of farm supplies, production activities on the farm, storage, processing and distribution of farm commodities and items made from them to the ultimate consumers. In Bauchi metropolis, it is important to man in so many ways, notably among them are the economic transformation, food security, innovation, technology and environmental stewardship.

Organic farming also known as ecological farming or biological farming uses organic fertilizer including compost manure, green manure, and born meal (Adeyanju et al., 2023). It emphasizes crop rotation and emerged in the early 20^{th} century as a response to rapidly changing farming practices. Organic farming represents an agricultural system that minimizes or eliminates the use of synthetic chemicals by adopting environmentally sustainable practices (Choundhary et al., 2025). Rather than depending on artificial fertilizers, pesticides, homicide or feed addictive, it incorporates natural alternatives such as animal manure, crop rotation, composted organic waste, and biological pest control methods to maintain soil fertility and plant health.

Biotechnology is defined as a set of tools that uses living organisms (or parts of organisms) to make or modify a product, improve plants, trees or animals, or develop microorganisms for specific uses (Croft, 2021). According to Croft (2021), agricultural biotechnology is the term used in crop and livestock improvement through biotechnology tools. Biotechnology

encompasses a number of tools and elements of conventional breeding techniques, bioinformatics, microbiology, molecular genetics, biochemistry, plant physiology, and molecular biology. The field of agricultural biotechnology has emerged as a crucial player in securing our planet's future. Fusing the principles of biology and technology, agricultural biotechnology strives to refine agricultural practices, amplify crop yields, and ensure food security while keeping the ecological footprint minima (Wang, 2023).

Statement of the Problem

Rapid urbanization and modernization are demotivating the new generation to take agriculture as their profession, so there is dire need to reshape the traditional agriculture activities to attract the young generation because in Nigeria, unemployment rates were very high (Baraya, 2021). In Nigeria, oil sector is the major income thereby neglecting very important sectors of the economy such as the agriculture. Due to decline in the price of the crude oil in the international market, the previous governments realize that the oil sector can no longer guarantee economic growth and sustainability.

This led to increased urgency of the need to revitalize the agricultural sector, possibly to return its glorious days when the agriculture's contribution to the Gross Domestic Product (GDP) was 90% (Ahunga et al., 2014), and had generated over 80% of the export earnings (Chijindu et al., 2021) which comes mostly from the Northern part of the country, until the oil boom of the 1970's when, also agricultural activities were neglected by the governments. This ugly trend plunged the country into massive food importation, hunger and unemployment (Obasessan, 2019).

The researchers observed that Bauchi metropolis is endowed with Agripreneurship who are involved in the production, processing and marketing of agricultural products, from the inputs level, there are biotechnology, Agri-processing as well as digital marketing which directly connects farmers to the customers thereby maximizing the role of middlemen in the food supply chain within the metropolis.

In spite of the above, there are many challenges faced especially on technology adoption, climate change and environmental stewardship as well as market volatility among others (Choundhary et al., 2025), that need to be addressed. For example, in Bauchi metropolis, the researchers past experiences have shown that SME farmers involvement is hindered by barrier such as limited access to knowledge, land, financial services, and policy making. It is based on the above that the study examined whether Agripreneurship practices have impact on food security and economic transformation.

Objectives of the Study

The main objective of the study is to examine the impact of Agripreneurship practices on food security and economic transformation among SME farmers in Bauchi metropolis, Bauchi state, Nigeria. Specifically, the study sought to;

1. determine the impact of organic farming on food security and economic transformation among SME farmers in Bauchi metropolis
2. examine the impact of Agricultural biotechnology on food security and economic transformation among SME farmers in Bauchi metropolis

Research Question

The following research questions were raised;

1. what is the impact of organic farming on food security and economic transformation among SME farmers in Bauchi metropolis
2. what is the impact of agricultural biotechnology on food security and economic transformation among SME farmers in Bauchi metropolis

Research hypotheses

The following null hypotheses were tested at 0.05 level of significance;

1. organic farming has no significant impact on food security and economic transformation among SME farmers in Bauchi metropolis
2. agricultural biotechnology has no significant impact food security and economic transformation among SME farmers in Bauchi metropolis

Literature Review

Theoretical Framework

The study was underpinned by the Diffusion of Innovation Theory developed by Everett Rogers (1962). The theory explains how new ideas, new technology such as the organic farming, agricultural biotechnology, and food processing, or other practices spread and are adopted by individuals and groups. The theory is based on the following components; innovation, diffusion, adapter and adoption process, communication; that is how the information can be spread, and then, influence. The theory therefore, is very much related to the current study because the objective of the current study was to find out the influence of organic farming, agricultural biotechnology and food processing toward food security and economic transformation among farmers. It also offers insight, concerning the integration of innovations and technologies for increasing food security and economic transformation among the populace.

Organic Farming

Organic farming is not a new phenomenon and is being practiced from ancient time. It is a harmonious interaction between land and man where crops are grown in a sustainable manner under a pollution free environment (Choundhary et al., 2025). It is a method of farming where cultivation is done in such a way to keep alive the soil healthy by using organic wastes of crops, animal farm, aquatic along with other biological materials and biological fertilizers to release nutrients for the crops for sustainability and ecofriendly production (Rana & Bisht, 2023).

Organic Farming is considered as a movement directed towards the philosophy of "Back to Nature". Which aims at low input farming thus reduces dependency on inorganic fertilizers, plant protection chemicals and weedicides (Bliska & Bliska, 2022). To make farming more sustainable, remunerative, and respectable so that natural soil and fertility are enhanced and to ensure soil and water conservation, along with agricultural bio- and food security (Adeyanju et al., 2023). To create a market for organic products managed and controlled by the farmers in domestic market, and to avoid, use of agrochemicals and other hazardous material and ensure chemical free water, soil, food, etc. can be stated as the main objectives of organic farming.

Agricultural Biotechnology

All living organisms have the ability to improve themselves through natural means in order to adapt to changing environmental conditions European Commission (2017). However, it takes hundreds of years before any detectable improvement is obtained. Man, then learned how to domesticate and breed plants in order to develop crops to his own liking and needs using various means including biotechnology. Biotechnology is defined as a set of tools that uses living organisms (or parts of organisms) to make or modify a product, improve plants, trees or animals, or develop microorganisms for specific uses (Croft, 2021).

According Croft (2021), agricultural biotechnology is the term used in crop and livestock improvement through biotechnology tools. Biotechnology

encompasses a number of tools and elements
of conventional breeding techniques,

bioinformatics, microbiology, molecular genetics, biochemistry, plant physiology, and molecular biology. The biotechnology tools that are important for agricultural biotechnology include (Croft, 2021):

i. Conventional plant breeding
ii. Tissue culture and micropropagation
iii. Molecular breeding or marker assisted selection
iv. Genetic engineering and GM crops
v. Molecular Diagnostic Tools

Agricultural biotechnology according to Thwari et al., (2024) refers to a range of tools including genetic engineering and some conventional breeding techniques to genetically modify living plants, animals, microbes, and other organisms for agricultural uses (e.g., food, feed, fiber). It also encompasses a range of new genome editing technologies that manipulate genetic material at precise locations in the genome. According to Thwari et al., (2024) most Genetically Engineered (GE) agricultural products are crops.

Research Methodology

The study adopted descriptive survey design. The study was conducted in Bauchi metropolis, Bauchi state, Nigeria. The population for the study was 215 registered SME farmers. Total population sample was used in the study, with only 176 valid responses were recorded. The instrument for data collection was a structured questionnaire. The instrument was subjected to face and content validation by two experts from the Faculty of Agric and Agricultural Technology, Abubakar Tafawa Balewa University, Bauchi state, Nigeria. In order to find out the reliability of the instrument, a pilot study was conducted using 25 SME farmers in Gombe state of Nigeria.

Reliability coefficient of. 0.78 was obtained using Cronbach alpha. The researchers employed and trained two research assistants who helped in the collection of data. Data collected from the study was analyzed using descriptive and inferential statistics of mean, standard deviation and simple linear regression respectively. Mean and standard deviation was used to answer research questions, while simple linear regression analysis was used to test null hypotheses at 0.05 significance level. The analysis was conducted using Statistical Package for Social Science (SPSS) version 23. The 2.50 criterion mean derived from the 4-point scale was used as the benchmark for determining mean. In the test of the null hypotheses, if $p \geq 0.05$, the null hypothesis was accepted, and if $p \leq 0.05$, the null hypothesis was rejected.

Results

Research Question One

What is the impact of organic farming on food security and economic transformation among SME farmers in Bauchi metropolis?

The results in Table 1 indicated the mean and standard deviation of responses ranging from 3.75 to 4.26 with standard deviation 1.06 to .819 and grand mean of 4.07 respectively. This clearly indicated that organic farming has impact on food security and economic transformation among SME farmers in Bauchi metropolis.

Table 1: Mean and standard deviation on the impact of organic farming on food security and economic transformation among SME farmers in Bauchi metropolis.

S/N	Items	N	Mean	SD	Remark
1.	Organic farming has implications for food security and contribute to environmental conservations	176	4.07	.874	Agree
2.	Organic farming has implications for economic transformation among peoples		4.19	.866	Agree

3.	**Organic farming affect livelihood of SME farmers**	**4.26**	**.819**	**Agree**
4.	Organic farming impact the income of SME farmers and sustainable agriculture	4.09	.802	Agree
5.	Organic farming affect nutritional quality and food safety	3.96	.947	Agree
6.	Organic farming affect nutritional quantity and food safety	3.75	1.06	Agree
7.	SME farmers have the opportunity to adopt organic farming practices, and enjoy support from policy makers in terms of training	4.21	.793	Agree
	Grand Mean	**4.07**	**.458**	**Agree**

Source; field work (2025).

Research Question Two

What is the impact of agricultural biotechnology on food security and economic transformation among SME farmers in Bauchi metropolis?

The results in Table 2 indicated the mean and standard deviation of responses ranging from 3.77 to 4.24 with standard deviation 1.00 to .892 and grand mean of 4.00 respectively. This clearly revealed that agricultural biotechnology has impact on food security and economic transformation among SME farmers in Bauchi metropolis.

Table 2: Mean and standard deviation on the impact of agricultural biotechnology on food security and economic transformation among SME farmers in Bauchi metropolis

S/N	Items	N	Mean	SD	Remark
1.	Genetically modified crops have risks for peoples	176	3.77	1.00	Agree
2.	Genetically modified crops have potential benefits for peoples		4.05	.895	Agree
3.	Agricultural biotechnology impact nutritional; contents		3.88	.894	Agree
4.	Agricultural biotechnology has impacts on food security		4.24	.892	Agree
5.	Agricultural biotechnology has impacts on crop yields and disease resistance		3.99	.943	Agree
6.	There is regulatory framework for the adoption of agricultural biotechnology		4.00	9.06	Agree
7.	Agricultural biotechnology has potentials on climate change and environmental stewardship		4.12	.878	Agree
	Grand Mean		**4.00**	**.550**	**Agree**

Source; field work (2025).

Null Hypothesis One

Organic farming has no significant influence on food security and economic transformation among SME farmers in Bauchi metropolis

The statistical evidence documented in Table 3 revealed that the variable organic farming had a standardized coefficient beta value of .276, p = .001. This indicated a significant influence of the variable in the study. The variable has a significant influence on food security and economic transformation among SME farmers in Bauchi metropolis. This result therefore, does not support the prediction of null hypothesis two that Organic farming has no significant influence on food security and economic transformation among SME farmers in Bauchi metropolis.

Table 3: simple linear regression analysis on the influence of organic farming on food security and economic transformation among SME farmers in Bauchi metropolis

Variable	Standardized Coefficients Beta	t-value	p-value	Decision
Organic farming	.276	3.131	.001	Rejected

Source: field work (2025).

Null Hypothesis Two

Agricultural biotechnology has no significant impact on food security and economic transformation among SME farmers in Bauchi metropolis

The statistical evidence documented in Table 4 revealed that Agricultural biotechnology had a standardized coefficient beta value of .237, p = .008. This indicated a significant impact of the variable in the study. The variable has a significant food security and economic transformation among SME farmers in Bauchi metropolis. This result therefore, does not support the prediction of null hypothesis two that Agricultural biotechnology has no significant impact on food security and economic transformation among SME farmers in Bauchi metropolis.

Table 4: simple linear regression analysis on the impact of Agricultural biotechnology on food security and economic transformation among SME farmers in Bauchi metropolis.

Variable	Standardized Coefficients Beta	t-value	p-value	Decision
Agricultural biotechnology	.237	2.637	.008	Rejected

Source: field work (2025).

Findings of the Study

1. The result of null hypothesis one revealed that organic farming had a standardized coefficient beta value of .276, p = .001. The variable has a significant influence on food security and economic transformation among SME farmers in Bauchi metropolis.
2. Statistical evidence from null hypothesis two revealed that Agricultural biotechnology had a standardized coefficient beta value of .237, p = .008. This indicated that the variable has a significant impact on food security and economic transformation among SME farmers in Bauchi metropolis.

Discussion of the Findings

The study's findings present significant insights into the impact of Agripreneurship practices on food security and economic transformation.

The finding of null hypothesis one posited that organic farming has a significant

influence on food security and economic transformation among SME farmers in Bauchi metropolis. The finding concurred with Dash and Amanja (2018) and Rana and Bisht (2023) who found in their separate studies that organic farming impact significantly to the overall health of the agroecosystem by enhancing soil biodiversity, natural maturity cycles, and ecological balance. This potential to increase food security, employment, stimulate and strengthen the agricultural contribution to the national economy (Choundhary et al., 2025). Choundhary et al., (2025) further posits that organic farming create opportunities, reduce poverty and drive climate change, which also agreed with the finding of the current study.

The finding of null hypothesis two revealed that Agricultural biotechnology had a standardized coefficient beta value of .237, p = .008. This indicated that the variable has a significant impact on food security and economic transformation among SME farmers. This is in line with the findings of Wang (2023), Qaim, M. Bt (2020) who found in their separate studies that from its origins in the Green Revolution to the frontiers of genetic engineering and precision agriculture, agricultural biotechnology has showcased its potential to tackle diverse challenges. The finding of the current study also concurred with Brookes G and Barfoot, P. (2017), Van-Esse, HP, Reuber, TL, van der Does, D. (2020) who found Genetically modified crops have the power to impact food security and fortify our food supply against threats, both biotic and abiotic, and also, precision agriculture, driven by data and innovation, promotes resource optimization, that is economic transformation. and minimizes the environmental toll.

Conclusion

The findings of this study suggest that the Agripreneurship practices entails a critical impact on food security and economic transformation among SME farmers in Bauchi metropolis. It was further established by this study that organic farming, agricultural biotechnology as well as food processing are some of the critical issues that will ensure food security and by extension improve economic development in Bauchi metropolis.

Recommendations

The study recommends that:

i. Bauchi state Agricultural Development Programme (BSADP) and Bauchi State Agricultural Cooperatives (BASAC) should provide basic training on organic farming, provide policy support, especially on tax, cost of farming and provide easy access to finance toward improving food security and economic transformation among SME farmers.

ii. Bauchi state government through its Agricultural Development Programme (ADP) should provide basic training and regulatory framework on new innovations and technology on agricultural biotechnology for the SME farmers. Bauchi State Agricultural Cooperatives (BASAC) should also subsidize the cost of farming and provide easy access to finance by the SME farmers to promote equity, inclusivity and accountability for improving food security and economic development.

References

Adeyanju, D.F., Mbunu, J., Wainuina, G., Chumo, C., Mignouna, N & Ashagidigbi, W. M. (2023). Can young agripreneurs improve their skills through Agripreneurship empowerment program? Evidence from Africa. *Heliyon*, 9(1).

Ahungwa, G., Haruna, U & Abdulsalam, Y. R. (2014). Trend of the contribution of agriculture to GDP in Nigeria (1960-2012). *Journal of agriculture and veterinary sciences*. 7(1), 50-55.

Baraya, A. U. (2021). *School factors and family background as determinants of entrepreneurship self-efficacy development among undergraduate students of accounting in universities within North-east, Nigeria*. PhD Dissertation. Department of Vocational and Technology education, Abubakar Tafawa Balewa University, Bauchi, Nigeria.

Bliska, A & Bliska, F. M de M. (2022). Transforming the farms into a rural entrepreneur as a path to sustainability. *Agronomy*, 12(4).

Brookes G, Barfoot, P. (2017). Environmental impacts of genetically modified (GM) crop use 1996–2015: Impacts on pesticide use and carbon emissions. *GM crops & food*; 8(2):117-47.

Chijindu, N. E., Rita, C. N & Obianuju, O. E. (2024). Agripreneurship development among small scale firm in Anambra state of Nigerian *Journal of agricultural extension and rural development.* 13(4), 273-279. ISSN: 2141-2170.

Choundhary, M., Milan, R & Parromita, P. (2025). Unlocking Agripreneurship potential: organic farming opportunitoies for rural India youth. *Inspira-Journal of commerce, economics and computer science,* 11(2). 1-9.

Croft, G. K. (2021). Agricultural biotechnology; regulations and selected policy issues. *Congressional research service*. Retrieved from https://crsreports.congress.gov on 26/4/25

Dash, D & Amandap. (2018). A review of an organic farming as a potentials sector of Agripreneurship development among the tribal youth of India. *International Journal of Agriculture, Environment and Biotechnology*. 11(5), 761-767.

European Commission. (2017). *New techniques in agricultural biotechnology*. Scientific Advice Mechanism (SMA). Luxemburg Publication. Brussels. ISSN: 978-92-79-66223-2

ISAAA. SEAsiaCenter. (2014). *Agricultural biotechnology*. *A lot more than just GM crops*. Retrieved from https://www.isaaa.org on 22/5/25.

Kukday, M. (2024). *Agripreneurship*. New Delhi. Akashdeep Printers.

Obasesam, O. (2019). *The paradox of Nigerian oil dependency*. Retrieved from www.portal.org, on 20/3/25.

Panishwad, M. P. (2019). *Entrepreneurship in Agriculture*: needs to incubate Agripreneurship. *Vivek resrarch e-jounal*. 13.

Qaim, M. Bt. (2020). cotton, yields and farmers' benefits. *Nat Plants*; 6 (11):1318-9.

Rana, J. C & Bisht, I. S. (2023). Reviving smallholder hill farming by involving rural youth in food system transformation and providing community-based Agri system. A case of Uttaralch state in north western India. *Sustainability,* 15(11).

Rogers, E. M. (1962). *Diffusion of Innovation. 1st ed*. Free press.

Sontakey, A. (2024). *Agripreneurship*. New Delhi. Akashdeep Printers.

Thwari, P. N., Thakur, S & Tripathi, M. (2024). *Agricultural biotechnology: a competitive note*. 1st ed. New Delhi. Akinik publication. https://doi.org/102271/ed.book.2603

Van-Esse, HP, Reuber, TL, van der Does, D. (2020). Genetic modification to improve disease resistance in crops. *New Phytol*. (1):70-86.

Wang, Y. (2023). Agricultural biotechnology: cultivating a greener future. *J Biotech and sPhytochem*, 7(4), 162.