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Effect of Agricultural Transformation Agenda Support Program Phase 1 (Atasp-1) on Farmers' Performance in Southeast, Nigeria

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ABSTRACT

This study examined the effect of Agricultural Transformation Agenda Support Programme Phase 1 (ATASP-1) on Farmers' Performance in Southeast, Nigeria. It used a well-structured questionnaire to collect data from a cross-section of randomly selected 730 respondents. A combination of analytical tools such as descriptive statistics, Tobit and multiple regression analysis and inferential statistics were used for analysis. The study found that 56.6% of the farmers are males with an average age of 44 years, who are 87.8% married and have 10 years of formal schooling. Apart from over 19 years farming experience, the average 6 people per household is large enough to supply cheap family labour to the farmers. The study found out that the programme interventions are classified into three important components, which are infrastructure, financial/market and commodity value chain development. It was also revealed that farmers adopted the following agricultural technologies: the use of improved seed varieties, the use of ICT extension facilities, and keeping a good farm/processing record to track changes, among others. The study, therefore, recommended among others, that the programme implementers need to be transparent in their disbursement and implementation of the project mandates and that there is a need to improve the literacy level of the farmers, as this will go a long way to improve their possibilities of technology adoption.

KEYWORDS: *Agricultural Transformation Agenda Support Program Phase 1 (atasp-1), Farmers, Performance, Technology Adoption and Southeast Nigeria*

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INTRODUCTION

Agriculture plays an important role in the enhancement of food security, poverty reduction, rural development and economic growth (Mwangi & Kariuki, 2015). It is the main source of income for rural people especially in the developing world (World Bank, 2008). Agricultural practice in developing economies is majorly at the subsistence level, revolving around smallholder farmers who rely on traditional methods of production and this has lowered the level of agricultural productivity. Muzari, Gatsi and Muvhunzi (2012) note that around 70% of agricultural production in developing countries is in the hand of smallholder farmers using traditional methods of production. Hence, triggering the need to increase productivity and sustainability in agriculture globally with much emphasis on specific means to achieve this aim through agricultural programme interventions (Muzari *et al*., 2012; Shao, 1996). These smallholder farmers are equally faced with a low level of income, high cost of inputs, poor access to irrigation facilities, pest and diseases that reduce yield, and high cost of labour among others which had affected the agricultural sector (Oluwadamilola, 2018).

There is a need to increase agricultural production in order to meet expected rising demand and, as such, it is instructive to examine the recent performance of the agricultural sector through the assistance of programme intervention that encourages the use of modern agricultural technologies (Challa, 2013). These technologies aided by agricultural programme

interventions include all kinds of improved techniques and practices which affect the growth of agricultural output (Jain *et al*., 2009). According to Loevinsohn, Sumberg and Diagne (2013), the most common areas to improve agricultural performance through modern technology use and promotion for crops production include new varieties and management regimes; soil as well as soil fertility management; weed and pest management; irrigation and water management. By virtue of improved input/output relationships, new technology tends to raise output and reduces the average cost of production which in turn results in substantial gains in farm income (Challa, 2013). All these are been addressed through government intervention programmes in agriculture.

Nigeria as a nation, being blessed with numerous national resources cannot play down on the importance of the agricultural sector, before the discovery of oil in the 60(s), agriculture was the highest employer of labour; employing over 70% of the rural population and earning about 60% of her gross domestic product (GDP) from agricultural sector sub-divided into crop production, livestock, fisheries, and forestry. This GDP earning declined tremendously to only witness an all-time maximum of 29.15% in the fourth quarter of the year 2018 due to the recent government approach to the sector (Obianefo, Okafor, Bola-Audu and Umebali, 2019). Anuba (2018) attributed these contributions to the Federal Government efforts to revive the ailing and moribund agricultural sector. Thus, suggesting the need to increase farmer's access to agricultural finance through various programme interventions that will help to meet the food need of the increasing human population.

Government has over the years introduced many programmes and policies geared towards enhancing agricultural activities. These programmes include the farm settlement scheme, the National Accelerated Food Production Programme (NAFPP) 1972, The World Bank-funded Agricultural Development Projects (ADP) 1975, River Basin and Rural Development Authorities (RBDA) 1976, National Seed Service (NSS), National Centre for Agricultural Mechanization (NCAM), Agricultural And Rural Management Training Institute (ARMTI) and Agricultural Credit Guarantee Scheme Fund (ACGSF), Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB), Operation Feed the Nation(OFN) 1976, Green Revolution Programme 1980, Directorate Of Foods Roads and Rural Infrastructure (DFFRI) 1987; Nigerian Agricultural Insurance Company (NAIC), National Agricultural Land Development Authority (NALDA), Specialized Universities for Agriculture, Root and Tuber Expansion Programme (RTEP) and rural banking scheme, National Economic Empowerment and Development Strategy (NEEDS) 2004 among others (Salami, 2007; Jibowo & Ajayi, 2011)

Other programmes created by the Federal Government include; FADAMA 1999; Value Chain Development Programme (VCDP) 2013, and Agricultural Transformation Agenda Support Programme Phase One (ATASP-1) 2014. These programmes are expected to; reduce rural poverty, increase Food security, accelerate incomes and shared wealth of the farmers on a sustainable basis, reduce post-harvest losses, attract private sector investment in agriculture, adapt research-extension transfer, input supply and rural infrastructure, facilitate land development and ensure efficient water resource management, provide portable water; provide rural electrification, transportation and communication development among others.

The focus of this study however is on Agricultural Transformation Agenda Support programme phase one (ATASP-1). The major objective of ATASP is to move from subsistence production to commercial production and improve the value chain, reduce wastage, increase productivity, and how to attract the necessary investments and entrepreneurial skills to the sector. It aims to contribute to food and nutrition security, employment generation and wealth creation along rice, cassava and sorghum value chains in the country. The extent to which these lofty goals and objectives of the programme have been achieved is still largely unknown, hence the need to undertake this study, with the major objective of evaluating the effect of Agricultural Transformation Agenda Support Program Phase 1(ATASP-1) on farmers' performance in Southeast, Nigeria. Specifically, the study seeks to:

1. identify and discuss the socio-economic characteristics of participating farmers, with the view of determining the appropriateness of their background to the programme,
2. explore the effect of ATASP-1 interventions on agricultural technology adoption by participants,

REVIEW OF RELATED LITERATURE

Conceptual Framework

Agricultural Transformation Agenda Support Program (ATASP-1)

ATASP-1 was established in 2015 to achieve the desired objectives that Agricultural Transformation Agenda (ATA) fail to achieve and to overcome the limitations of ATA which was part of the Federal Government of Nigeria's effort to revamp the

Agricultural Sector, ensure food security, diversify the economy and enhance foreign exchange earnings (Agricultural Development Bank Group (ADBG), 2013). The Federal Ministry of Agriculture and Rural Development (FMARD), embarked on Agricultural Transformation Agenda support programme-1 with a focus on the development of agricultural value chains, including the provision of improved inputs such as seeds, fertilizer, increased productivity and production, as well as the establishment of Staple Crop Processing Zones. It also aimed at addressing the reduction in post-harvest losses, improving linkages with industry with respect to backward integration, as well as access to financial services and markets (Alhassan *et al.*, 2019). The Agricultural Transformation Agenda Support Programme-1 targets rural communities particularly women, youth and farmers associations as well as improving rural institutions and infrastructure (Federal Government of Nigeria (FGN), 2015).

1. Agricultural Intervention Activities of ATASP-1

According to Agricultural Development Bank Group (ADBG, 2013), Agricultural Transformation Agenda Support Program Phase 1(ATASP-1) has three components of implementation for the promotion activities namely;

A. Infrastructure Development
B. Commodity Value Chain Development (Advisory Services, Agro input supply and capacity building)
C. Program Management

The environmental and social impacts and benefits of the Project have been analyzed through a detailed Strategic Environmental and Social Assessment (SESA) in line with the requirements of the Nigerian environmental regulations, and the Bank's Environmental and Social Assessment Procedures (ESAP, 2001). The expected impact of the Agricultural Transformation Agenda Support Program Phase 1 (ATASP-1) is to contribute to the private-sector-led agricultural growth for food security, creation of jobs and shared wealth. Its specific objective is to increase on a sustainable basis the income of smallholder farmers and rural entrepreneurs that are engaged in the production, processing, storage and marketing of the priority commodity value chains. ATASP-1 aims to improve agricultural production and productivity. To achieve this, the Program will comprise the following components for the promotional activities in Table 1.

Table 1: ATASP-1 Intervention Activities.

Component	Total Costs (UA million)	Component Description
Infrastructure Development	71.56 (55.0%)	Rehabilitation of agricultural and ancillary social infrastructure including 1,300km of irrigation water conveyance canals (Kebbi, 280km; Sokoto, 175km; Niger, 220km; Kano, 230km; Enugu, 125km; Anambra, 75km and Jigawa, 195km). 1,007 units of various hydraulic structures (Kebbi, 167; Sokoto, 120; Niger, 229; Kano, 104; Enugu, 182; Anambra, 100 and Jigawa, 105). 1,330km of feeder roads (Kebbi, 265km; Sokoto, 55km; Niger, 235km; Kano, 330km; Enugu, 115km; Anambra, 80km and Jigawa, 250km). Rehabilitation of 35 primary schools (5 per state), 14 health centres (2 per state), 70 potable water supply and sanitation schemes (10 boreholes and accessories per state). 21 demonstration and technology centres (3 per state), 21 community markets and storage facilities (3 per state).
Commodity Value Chain Development	38.10 (29.3%)	Capacity development for public (agricultural research, extension, relevant ministries' development such as Rural Development and FMARD, Monitoring and Evaluation for efficient external supervision), private (MFIs, agro-dealers, etc) and community-based (producers' organizations, cooperatives, inter-professional bodies, etc.) institutions, training value chain actors in technical and managerial skills, promoting the use of science and technology, training in post-harvest reduction methods including food processing, business and entrepreneurship training, training of communities and health workers on prevention and management of common diseases as well as good nutrition, sanitation and hygiene practices, development of market information system (MIS), management of environmental and social impacts, implementation of policies to promote private investment in agriculture.

Program Management	20.43 (15.7%)	Coordination and supervision of program activities and program day to day management based on adequate results measurement framework, Environmental and Social Management Plan (ESMP) implementation and supervision, program procurement, disbursement, financial management, audit and reporting.
Total	130.09	

Source: African Development Bank Group (ADBG, 2013).

ATASP-1 is implemented in four Staple Crops Processing Zones (SCPZs) of Adani-Omor, Bida-Badeggi, Kano-Jigawa and Kebbi-Sokoto, and it covers 21 Local Government Areas (LGAs) in seven states: Anambra (Ogbaru and Orumba North LGAs), Enugu (Uzo Uwani LGA), Jigawa (Hadejia LGA), Kano (Bunkure, Kura and Rano LGAs), Kebbi (Argungu, Bagudo, Birnin Kebbi, Dandi, Ngaski, Shanga and Suru LGAs), Niger (Agaie, Gbako, Lapai, Lavun, Katcha and Mokwa LGAs) and Sokoto (Kware LGA). The Processing Zones are specially surrounded by expanses of land in areas of high agricultural production and potential where the localized provision of a well-developed physical infrastructure such as access roads and energy, as well as water, are necessities to support production, processing and marketing activities for selected commodities. The selected areas in the processing zones are 39,560 hectares that have a high potential for rice, cassava, and sorghum production and are among the 13 processing zones identified in the country's ATA (ADBG, 2013).

The direct beneficiaries are the 45,300 farmers and rural entrepreneurs participating in commercial agriculture production and value chains. This number is expected to increase significantly when other economically active value chain entrepreneurs enlist in the Program. The indirect beneficiaries include existing or potential small, medium and large-scale entrepreneurs and business associations who provide services to rural households. Among the target group, women and youth play a major role in crop and animal production, processing, small enterprises operation and marketing. They will be specifically targeted for Program activities and benefits. The Government of Nigeria has designated thirteen sites as Staple Crop Processing Zones (SCPZ), which should be the entry points for any agricultural interventions in the country. Out of the thirteen, the African Development Bank (ADB) has elected to work in four zones; Binda–Badeggi (Middle belt), Adani–Omor (East), Kebbi (North West), and Kano (North).

The proposed intervention will complement the existing bank assisted programme and complement IFAD's Community-Based Agriculture and Rural Development Project (CBARDP) and Community-Based Natural Resource Management Program (CBNRMP) as well as the World Bank (WB) Fadama III, Sustainable Land Management (SLM) and the West Africa Agricultural Productivity (WAAP) projects. The ATASP Phase 1 (2014-2019) would entail a multi-sectoral operation that would lead to the development of agricultural value chains for selected crops. The project would contribute to poverty reduction and food security by enhancing the income of smallholder farmers and small or medium-scale processors that are engaged in the production, processing, storage and marketing of rice and cassava on a sustainable basis. The Bank's involvement will help:

1. complement and support the Government's efforts for enhanced food security in the country.
2. support the ATA, a top priority program of the Government.

The main ATASP-1 project looks at constructing or rehabilitating agricultural and value addition infrastructure, including conservation works. The complementary initiatives that are proposed to improve the ATASP-1 project's environmental or social performance according to ADBG (2013) include the following:

A. Capacity building
B. Reforestation
C. Catchment management of the facility or scheme hinterland
D. Production of organic manure from agro-processing waste
E. Health and HIV/AIDS mainstreaming
F. Agro-forestry
G. Stream bank stabilization and river training
H. Enhancing communication.

Performance and Farm Performance

Performance

Performance is the act or process of performing a task, an action and so. Performance is defined as the accomplishment of a given task measured against pre-set known standards of accuracy, completeness, cost and speed. In a contract, performance is deemed to be the fulfilment of an obligation in a manner that released the

performer from all liabilities under the contract business. Avram and Rus (2000) had the opinion that the term performance has a Latin origin, where the verb performance had the meaning of finalizing a predetermined activity. Now a day the significance of performance comes from the English Language from the verb to perform which signifies the regular accomplishment of a thing that requires ability or a certain skill. The noun performance denotes the manner of achieving the objectives predetermined by an entity.

The concept of performance has been based on many criteria. It has been posited that the performance of a business founder is measured by the performance of the organization. This in turn is influenced by the environment in which the organization emerges. Among the frequently used measures of performance are annual sales, number of employees, growth in sales and growth in employee number (Mohammed and Abu, 2012). Oforegbunam and Okorafor (2010) and Akinnawo (2003) measured SME performance using four basic parameters critical to their operations. These include the ability to meet planned output quantities, the ability to meet market demand for product/service, the ability to deliver quality products/service to customers, and, above all, the ability to meet planned profit levels.

Farm Performance

It is not an overstatement to assert that the growth and development of any nation depend to a large extent on the development and performance of agriculture (Ehigiamusoe, 2012). Unlike traditional development economists such as Arthur Lewis who believed that agriculture plays a passive and supportive role, modern development economists have come to realize that the agricultural sector in particular and the rural economy, in general, must play an indispensable part in any overall strategy of economic progress, especially in developing countries. More importantly, the majority of the world's poor live in rural areas, depends upon agriculture for their livelihood. Agriculture is, therefore, critical both for poverty reduction and economic development (Abayomi, 1997). The agricultural sector continues to play a crucial role in development, especially in low-income countries where the sector is large both in terms of aggregate income and total labour force. Stagnation in agriculture is the principal explanation for poor economic performance while rising agricultural productivity has been the most important concomitant of successful industrialization. Generally, the sector contributes to the development of an economy in four major ways namely; product contribution, factor contribution, market contribution and foreign exchange contribution (Abayomi, 2002). Agricultural production continues to rise around the world, broadly keeping pace with the rising population. The ability of agricultural production to keep pace with world population growth has been impressive, defying some neo- Malthusian predictions that global food shortages would have emerged by now. And it has been output gains in the developing world that have led the way.

Farm Technology Adoption

The traditional approach of the food industry is undergoing a fundamental transformation. The first technology revolution in agriculture made an impressive stride between 1961 and 2004; cereal yield rose by 2.8 percent a year. This was made possible by modern farming practice which includes the use of irrigation, use of fertilizer and pesticides while lowering the level of greenhouse gas (GHG) and coping with climate change (World Bank, 2008). Old technologies must be maximized and a new one generated since there is a need for the world to produce 70 per cent more food for the world by 2050 (De-Clercq *et al*., 2018). Corroboratively, Abdullahi *et al.* (2015) noted that AT is the solution to meet the food demand of the growing population in a rapidly changing world with the prospect of decreasing arable land due to urbanization and industrialization. Some of the AT needed to increase food production by 70 percent in 2050 includes; information communication technology gadgets (ICT), farm management software, wireless sensors, a global positioning system (GPS), agricultural machinery, among others.

National Institute of Food and Agriculture (Retrieved 6 June 2020) referred to agricultural technologies (AT) as a shift from the traditional or old system of farming operations. The introduction of AT has innovatively reduced the demand for water use, fertilizer and pesticides application, a reduced impact on the ecosystem increased food production, among other things. AT allows agricultural business to be more profitable, efficient, safer and more environmentally friendly (De-Clercq *et al.,* 2018). AT plays a pivotal role in sustaining both the expanding population and their current and future prosperity, yet a profound ignorance of the importance of these technologies at all level of the society has led to the regulatory regime that limits or prevent their application at a time of increasing need for their benefit (Bartholomaeus, 2018). Thus, Nhamo and Chikoye (2017) assert that AT is mainly to increase production, resolve biological, physical and socioeconomic issues related to farming systems. Therefore, there is a need to tailor AT to a specific need or circumstance as well as future sustainability and climate change projection. Future food production will rely heavily on the successful integration of a range of technologies. The specific need like Edward and Duffy (2014) who assert that the use of GPS to pinpoint the

exact spot on the farm will help the farmers collect very precise data about the crop yield, moisture and incidence of pests. Therefore the application of fertilizer, pesticides and irrigation can be modified to fit the very small area to improve the efficiency with which farm resources are used.

No matter how good AT is, it needs to be transferred, diffused and adopted by the farmers who needs it for meaningful improvement for the preparation of the 70 percent increase in world food production by 2050. This AT transfer is being facilitated by extension services, thus, Loevinsohn *et al*. (2012); Obianefo (2019) opined that adoption is the process of accepting a new system or ways of doing things (planting, processing, etc.) different from what the people are traditionally used to. These affirmed Bonabana-Wabbi (2002) who asserted that adoption is the integration of new technology into an existing practise that is usually proceeded by a period of trying and some degree of adaptation. This technological adoption was insinuated by Bonabana-Wabbi (2002); Obianefo (2019) s a mental process an individual passes from the first time they heard about the innovation to the time of final utilization of it.

METHODOLOGY

A survey research design was adopted for the study. The study area is ATASP-1, Adani-Omor Zone made up of Anambra and Enugu States, Nigeria. Based on the information supplied from the programme database, a total of 8,585 (Rice 3248 and Cassava 5337) farmers are participating in the programme from Anambra and Enugu constitute the population for the study. A multi-stage sampling technique was employed by the researcher for the selection of the study representative. Taro Yamane sample size determination was further used to derive the sample size (730) of the study. R. Kumaison formula was adopted to allocate sample stratum for the study. Primary and secondary data were collected and used in the study. The instrument was validated by ATASP-1 programme Coordinator in Anambra and Enugu State, and two experts from the Department of Cooperative Economics and Management. A test-retest method was used to establish the reliability of the research instrument. Copies of the questionnaire for the study were administered to forty (40) ATASP-1 farmers twice after a fortnight and their responses were subjected to Crombach's Alpha test of reliability, where their internal consistency was determined at 5% Alpha level of significance and a 91% consistency level was established. The study utilized a combination of descriptive, regression and inferential statistics in data analysis. Objective one was achieved using descriptive statistics such as means score from five-point Likert scale while objective two was achieved with a two-stage regression of probit and marginal effect (dy/dx). The hypotheses were tested at 5% of significance.

DATA ANALYSIS AND RESULTS PRESENTATION

Discussion of the Socioeconomic Characteristics of the Participants with the view of determining the appropriateness of their background to the programme

Table 1a: Socioeconomic characteristics of the respondents (n = 666)

Sn.	Variables	Frequency	Percentage (%)	Mean
1	**Sex:**			
	Female	289	43.4	
	Male	377	56.6	
2	**Age (years):**			
	≤ 39 years	204	30.6	
	40 – 59 years	417	62.6	44.01
	60 years and above	45	6.8	
3	**Marital status:**			
	Married	585	87.8	
	Otherwise	81	12.2	
4	**Level of education:**			
	0 (no formal education)	89	13.4	
	1 – 6 years (primary)	312	46.8	
	7 – 12 years (secondary)	253	38.0	10.04
	13 – 18 years (tertiary)	7	1.1	
	Above 18 years (postgraduate)	5	0.8	

5	**Primary occupation:**			
	Civil servants	132	19.8	
	Trading	132	19.8	
	Unemployed	112	16.8	
	Farmers	283	42.5	
	Retired	7	1.1	
6	**Farming experience (years):**			
	1 – 5 years	50	7.5	
	6 – 10 years	150	22.5	19.92
	11 – 15 years	83	12.5	
	above 15 years	383	57.5	
7	**Household size (people):**			
	1 – 3 people	76	11.4	
	4 – 7 people	430	64.6	5.82
	above 7 people	160	24.0	
	Above 300,000	14	2.1	

Source: Field Survey Data, 2021.

Table 1a shows the socioeconomic characteristics of the participants. It revealed that the majority (56.6%) of the participants are male, while the remaining are female. The table shows that 62.6% of the participants are within the age of 40 – 49 years, 30.6% are within ≤ 39 years and 6.8% are 60 years and above. The study revealed that the average age of the farmers was approximately 44 years. Also, the majority (87.8%) of the farmers are married, while others fall into other categories which means that they are either single or separated. The table shows that a greater proportion (46.8%) of the farmers had primary education, while others had secondary (38.0%), no formal education (13.4%), tertiary (1.1%) and post graduate education (0.8%). The average years spent in the formal institution was approximately 10 years. The table shows that 42.5% of the participants are primarily farmers, while 19.8% of them are civil servants and traders, 16.8% of them are unemployed and 1.1% of them are retired from active service. It was also shown in the Table that the majority (57.5%) of the farmers had above 15 years of farming experience, while others had 6 – 10 years (22.5%), 11 – 15 years (12.5%) and 1 – 5 years (7.5%) farming experience. The average farming experience was 19.9. On household size, the table shows that the majority (64.6%) of the farmer's household size was 4 – 7 people, while others had above 7 people (24.0%) and 1 – 3 people (11.4%) respectively. The average household size was 5.82.

Table 1b: Socioeconomic characteristics of the respondents continued

Sn.	Variables	Frequency	Percentage (%)	Mean
8	**Farm size (ha):**			
	0 – 2 ha	468	70.3	
	3 – 4 ha	170	25.5	2.43
	Above 4 ha	28	4.2	
9	**Commodity type:**			
	Cassava	341	51.2	
	Rice	325	48.8	
10	**Enterprise type:**			
	Production	570	85.6	
	Processing	45	6.8	
	Marketing	51	7.7	
11	**Pre output (tons):**			
	≤ 10 tons	528	79.3	
	11 – 20 tons	96	14.4	8.49
	Above 20 tons	42	6.3	
12	**Post output (tons):**			
	< 20 tons	509	76.4	
	21 – 30 tons	87	13.1	17.40
	Above 30 tons	70	10.5	

Source: Field Survey Data, 2021.

Table 1b is a continuation of the socioeconomic characteristics of the participants. For farm size, it was revealed that the majority (70.3%) of the farmers had 0 – 2 ha farmland, while others had 3 – 4 ha (25.5%) and above 4 ha (4.2%). The mean farmland was 2.43 ha. 51.2% of the farmers are cassava farmers while 48.8% of them are rice farmers. In an attempt to deliver the project mandate, the majority (85.6%) of the farmers are producers, while 7.7% are marketers and 6.8% are processors. The table shows that before the programme intervention, 79.3% of the farmer's annual output was ≤ 10 tons, while 14.4% are from 11 – 20 tons and 6.3% are above 20 tons. The study also revealed that the majority (76.4%) of the farmers recorded ≤ 20 tons per annum since joining the programme, while others recorded 21 – 30 tons (13.1%) and above 30 tons (10.5%). The findings revealed that the annual farm output as a result of programme participation was 17.40 tons.

ATASP -1 Intervention Projects

Table 4.2a: ATASP -1 Intervention projects

S/N	ATASP -1 Intervention projects	Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree	Total	Mean
A.	**Infrastructure development:**							
i	Construction of feeder roads	265	288	372	398	218	1541	2.31
ii	Land development	245	620	483	512	45	1905	2.86
iii	Construction Market Store and Stall	760	736	537	126	88	2247	3.37
iv	Drilling of borehole and pipe-borne water projects	270	300	381	326	247	1524	2.29
v	Construction of canals/irrigation	175	608	513	404	106	1806	2.71
vi	Establishment of Aggregation Centre	765	680	633	154	55	2287	3.43
vii	Provision of Toilets	710	644	501	176	108	2139	3.21
viii	Upgrading of milling centres	775	596	537	212	77	2197	3.30
	Cluster mean							**2.94**
B.	**Financial/market development**							
ix	Provision of financial grants to cooperatives	1175	792	429	112	34	2542	3.82
x	Purchase of micro-enterprises equipment (Threshers, parboiling drum, Tricycles, Harvesters, Planters, power tiller, De-stoner, Knapsack sprayer)	800	744	342	246	83	2215	3.33
xi	Provision of startup capital to artisan and petty traders	1265	880	354	88	31	2618	3.93
xii	Giving welfare and upkeep funds to widows, elderly people and vulnerable groups	1290	792	384	90	37	2593	3.89
xiii	Provision of Input (Seed/Fertilizer/Bundles/chemicals)	575	412	402	296	166	1851	2.78
xiv	For quality measure: Provision of weight and measure (scales)	670	700	666	162	54	2252	3.38
xv	Linkages to off-takers	585	632	453	290	95	2055	3.09
xvi	Formation of commodity alliance forum	520	512	447	354	108	1941	2.91
	Cluster mean							**3.39**
C.	**Commodity value chain development**							
xvii	Youth and women empowerment Programme	765	696	588	110	88	2247	3.37
xviii	Linkages to Agro dealers	850	804	546	152	37	2389	3.59
xix	Training on Good Agronomic Practices (GAP)	895	780	543	106	58	2382	3.58
xx	Capacity building and skills acquisition Training (Training of Fabricators/Input dealers/women on crop processes, business model development)	885	696	498	118	90	2287	3.43

xxi	Capacity building on conflict resolution	855	712	549	154	57	2327	3.49
xxii	Provision of soil laboratory for soil testing	1045	836	609	66	12	2568	3.86
xxiii	Gender equality campaign	885	736	597	138	37	2393	3.59
xxiv	Capacity building on learning routes	515	592	648	346	26	2127	3.19
xxv	Training on Smart tractor and Power tiller operation	925	696	342	284	51	2298	3.45
	Cluster mean							**3.51**

Source: Field Survey Data, 2021.

The programme intervention and participants agree to the existence of the projects is presented in table 4.2a. The researcher used five points Likert scale to capture information on the project intervention, a benchmark of 3.0 was set as the mean threshold upon which decision on whether the farmers are in agreement or disagreement with the project under view was accepted. Projects with a mean score of 3.0 and above were accepted while those below the threshold of 3.0 were rejected. These projects interventions were classified into three (infrastructure, financial/market and commodity value chain development).

Based on the eight items of **infrastructure development** projects listed, four had a mean threshold of 3.0 which implies that the infrastructure development interventions completed and in agreement with the farmers are construction market store and stall (m = 3.37), the establishment of aggregation centre (m = 3.43), provision of toilets (m = 3.21) and upgrading of milling centres (m = 3.30). The cluster mean of 2.94 is an indication that most of the projects are still ongoing or are yet to be completed and put into use by the farmers or beneficiaries.

Equally, for the financial/market development interventions, based on the eight items of financial or market development interventions identified, six had a mean threshold of 3.0 which are the provision of financial grants to cooperatives (m = 3.82), purchase of micro-enterprises equipment (threshers, parboiling drum, tricycles, harvesters, planters, power tiller, de-stoner, knapsack sprayer) (m = 3.33), provision of startup capital to artisan and petty traders (m = 3.93), giving welfare fund and upkeep fund to widows, elderly people and vulnerable groups (m = 3.89), for quality measure: provision of weight and measure (scales) (m = 3.38) and linkages to off-takers (m = 3.09). The cluster mean of 3.39 implies that the programme beneficiaries agreed to most of the items listed.

Furthermore, table 4.2a revealed that out of the nine items of commodity value chain development intervention listed, nine of them had a mean threshold of 3.0 which are youth and women empowerment programme (m = 3.37), linkages to agro-dealers (m = 3.59), training on good agronomic practices (gap) (m = 3.58), capacity building and skills acquisition training (training of fabricators/input dealers/women on crop processes, business model development) (m = 3.43), capacity building on conflict resolution (m = 3.49), provision of soil laboratory for soil testing (m = 3.86), gender equality campaign (m = 3.59), capacity building on learning routes (m = 3.19), training on smart tractor and power tiller operation (m = 3.45). The cluster mean of 3.51 is an indication that the beneficiaries accented to the intervention under view.

2. Agricultural Technology Adoption

Table 4.2b: Agricultural technology adoption

Sn.	Technology adopted	strongly adopted	adopted	moderately adopted	not adopted	Strongly not adopted	Total	Mean
i	Use of improved seed variety	820	560	471	188	111	2150	3.23
ii	Use of climate-smart agriculture	35	200	783	514	91	1623	2.44
iii	Use of ICT extension facility (android, etc.)	375	688	840	236	21	2160	3.24
iv	Soil test	240	1192	450	200	70	2152	3.23
v	Seed/germination test	70	456	624	472	94	1716	2.58
vi	Use of tractor for land preparation	400	420	426	472	103	1821	2.73
vii	Observing best practices in farming and processing	25	0	396	564	247	1232	1.85

viii	Keeping good farm/processing record to track changes	620	628	609	232	66	2155	3.24
ix	Observing planting/sowing depth and distance	50	48	564	530	191	1383	2.08
x	Use of fertilizer	615	516	531	246	114	2022	3.04
xi	Use of agro-chemical	635	580	429	244	129	2017	3.03
xii	Purchase of input from certified agro-dealer	550	452	582	334	82	2000	3.00
xiii	use of global positioning system (GPS)	465	852	717	180	31	2245	3.37
xiv	Use of planter	990	976	231	186	54	2437	3.66
xv	Use of harvester	830	1132	168	194	64	2388	3.59
	Cluster mean							**2.95**

Source: Field Survey Data, 2021.

Table 4.2b shows the agricultural technology adoption of the respondents. Five points Likert scale was equally used to capture information on technology adoption by the programme participants, a benchmark of 3.0 was set as the mean threshold upon which decision on whether the farmers adopted or did not adopt a particular technology. Technology with a mean score of 3.0 and above was adopted while those below the threshold of 3.0 was not adopted. Based on the fifteen (15) technology disseminated to the farmers, ten (10) had a mean threshold of 3.0 which are use of improved seed variety (M = 3.23), use of ICT extension facility (android, etc.) (M = 3.34), soil testing (M = 3.23), keeping good farm/processing record to track changes (M = 3.24), use of fertilizer (M = 3.04), use of agro-chemical (M = 3.03), purchase of input from certified agro-dealer (M = 3.00), use of global positioning system (GPS) (M = 3.37), use of planter (M = 3.66) and use of harvester (M = 3.59). The cluster mean of 2.95 is an indication that the farmers have not completely adopted the technology disseminated in the programme.

Effect of ATASP-1 Interventions on Agricultural Technology Adoption by Participants.

Table 4.2c: Tobit estimation of the effect of ATASP-1 intervention on agricultural technology adoption.

Promotional activities	Coefficient	Std. Err.	t-ratio
Infrastructure development	0.033	0.003	12.74***
Financial/market development	0.018	0.004	4.63***
commodity value chain development	0.011	0.004	2.87**
Constant	1.360	0.162	8.4***
Diagnostic statistics			
Pseudo R^2	0.805		
Likelihood ratio (LR)	401.18***		
Log-likelihood ratio	-48.624		
N	666		

Source: Field Survey Data, 2021. (*) Sig. @ 10%, (**) Sig. @ 5%, (***) Sig. @ 1%

The study adopted a censured regression analysis to investigate the effect of the programme intervention on the adoption behaviour of the farmers. The Pseudo R^2 which is the same as the coefficient of multiple determinants had the value of 0.805 implying that the project interventions explained 80.5% variation in farmer's technology adoption, while the remaining 19.5% unexplained was as a result of external noise or error beyond the project implementation. The likelihood ratio (401.18***) was significant at a 1% level of significance which implies that programme intervention had a significant effect on the general model and was a good fit.

The coefficient of infrastructure development (0.033) was positive and significant at a 1% level of significance, this implies that a marginal increase in the number of infrastructure interventions will increase or aid farmer's technology adoption by 3.3%. Again, the coefficient of financial/market development (0.018) was positive and significant at a 1% level of significance, this implies that a marginal increase in the number of financial/market development interventions will increase or aid farmer's technology adoption by 1.8%.

Furthermore, the coefficient of commodity value chain development (0.011) was positive and

significant at a 1% level of significance, this implies that a marginal increase in the number of commodity value chain development interventions will increase or aid farmer's technology adoption by 1.1%. If all things being equal and other variables held constant, the technology adoption will increase by 1.360 units which means that the cluster mean of 2.95 for technology adoption will approach the accepted range of 3.0. With this in mind, the null hypothesis one was rejected, hence, the significant effect of ATASP-1 intervention on technology adoption has been established.

Conclusion

This study on the effect of agricultural transformation agenda support programme phase 1 (ATASP-1) on farmers performance in Southeast, Nigeria is an important study, especially at this time. Efforts should be made at different policy levels to critically think of measures to bring solutions to the table as this measure will go a long way to reduce social vice, rural-urban migration, land grabbing among other issues that have threatened the food trajectory in Nigeria. Rural interventions are key to promoting the agricultural supply chain to improve the performance of farmers who are the end-users of the packages. This rural intervention is what we need now to salvage food insecurity; the study, therefore, makes the following suggestion/recommendation:

Recommendation

1. Programme implementers are advised to be transparent in their disbursement and implementation of the project mandates
2. There is a need to improve the literacy level of the farmers maybe by encouraging them to enrol in school as this will go a long way to improve their possibilities of technology adoption.
3. An increase in programmes targets on processors and marketers are advised as this process will help to improve the linkages between the value chain actors.
4. There is a need for more rural development programmes in the Zone. This will increase their livelihood and reduce urban migration and poverty.
5. The programme is encouraged to quickly complete all the ongoing projects in the rural areas.

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