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Effect of Technological Deployment on Performance in the Federal Ministry of Agriculture and Food Security, Nigeria

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Abstract

This study examines the effect of technological deployment on the performance of the Federal Ministry of Agriculture and Food Security (FMAFS), a public sector organisation in Nigeria. The research is grounded in the Technology Acceptance Model (TAM). The study used a quantitative research technique with a sample size of 352 employees selected using a stratified random sampling selection procedure. The data were analysed using linear multivariate regression models with the aid of the Statistical Package for Social Sciences (SPSS) version 27.0. Findings from the research indicate that the interactions between the deployment of digital technologies within FMAFS for its management processes and agricultural technologies by FMAFS targeted at boosting food production explain 62.8% to 63% of changes in the level of performance in FMAFS. The aggregate deployment of both dimensions of technologies was shown to have a positive significant effect on the performance of the Ministry. The results also indicate that the agricultural technologies deployed for food production has a positive significant effect on the level of food production especially the deployment of agricultural research innovation, and improved varieties of crops and livestock breeds. The study concludes that technological deployment has a significant effect on performance in the Ministry. It recommends increased investment in emerging digital and agricultural technologies especially those that have been shown to have the most significant positive effects on overall performance and food production. It also recommends partnerships and synergy with research institutions, farmers' associations, and the private sector to achieve this.

Keywords: *Technology, Technological deployment, Performance, digital technologies, agricultural technologies, Food security*

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Introduction

Technological advancements set the pace for achieving development in our contemporary world and these advancements are in a constant state of evolution (Ozsungur, 2019). Innovation and process enhancements are present in all industries. Therefore, any organisation, whether public or private, must constantly update and incorporate the latest technological advancements in its field. Technological products are always changing, leading to a rise in international competition and the need to embrace and adapt to new technologies. Company growth depends on their ability to improve operations and processes via the adoption of new technologies (Martincevic and Kozina, 2018).

The recent COVID-19 epidemic disrupted workplace order, interactions, transactions, and commitments over the internet became more frequent. The sure way to combating the effect of the pandemic by small and medium-sized enterprises is through embracing innovative technologies. This way they can reach current and prospective consumers via e-commerce, social media, and other online platforms (Pu *et al*. 2021). An organisation's sustainability depends on its ability to compete within its industry and adapt to the fast-paced business climate of today by leveraging on emerging technologies.

The public sector, such as Nigeria's Federal Ministry of Agriculture and Food Security, even though not in competition with any organisation still owes the Nigerian citizens an efficient and effective service delivery. Onyekwelu and Dike (2016) agree that the public service has the responsibility of offering high-quality goods and services to the public. Recent information and communication technologies (ICT) enable public sector to do this in an open and transparent manner (Xanthopoulou, 2021). The Nigerian Office of the Head of the Civil Service of the Federation (OHCSF) established the Federal Civil Service Strategy and Implementation Plan 2017-2020 (FCSSIP20) and its follow-up, FCSSIP25, to rejuvenate the service (OHCSF, 2022). The plan has six components, such as Institutionalising Innovation in the Public Service and Digitalization: Accelerating Content Services Platform Delivery. Hence, the public service appreciates the importance of technology in delivering services.

The Federal Ministry of Agriculture and Food Security in support of the Federal Civil Service's digitization policy encourages the use of ICTs for internal and stakeholder communication, as well as other pertinent digital technologies. The Ministry could also leverage on the use of agricultural technologies, be it digital, such as Global Positioning System (GPS), Geographic Information System (GIS), smart agriculture, and precise agricultural automation as well as other farming techniques and machinery (Chauhan, 2015). The need for this has become even more urgent to mitigate the effect of the COVID-19 pandemic and Climate change. The Nigerian agriculture sector saw a growth rate of 2–3% from 2016 to 2019 before the Pandemic. However, at the onset of the Pandemic it entered a recession in the second quarter of 2020 and this was projected to continue until 2022 (FMARD,2022).

Studying the effect of technology deployment on performance of the Federal Ministry of Agriculture and Food Security is therefore crucial. Although attempts have been made to

improve agricultural output using Information and Communication Technology (ICT) and other novel techniques, gaps in current understanding remain. Rural farmers' willingness to utilize helplines and extension services, capacity building efforts in agriculture, and the economic risks linked to technological reliance in agribusiness underscore the intricate nature of these issues (Bashir *et al.*, 2022; Adeyemi *et al.*, 2022; Zemlyakova, 2023).

The challenges faced encompass various aspects such as breakthrough import substitutions, the impact of climate change on agriculture, and the potential of agricultural biotechnology in economic growth, as highlighted by Vorotnikov and Muravyeva (2020), Diagi *et al.* (2021), and Odidi *et al*. (2022). The varied viewpoints highlight the need for a thorough investigation into the gaps in current literature about how technology deployment affects performance in the Federal Ministry of Agriculture and Food Security in Nigeria. It is essential to comprehend the preparedness of farmers, the economic risks linked to technological reliance, and the impacts of climate change and biotechnology on agricultural output to create specific interventions that may improve performance in the sector. Addressing these deficiencies would enhance the agricultural development knowledge base and guide evidence-based policies to promote sustainable growth and food security in Nigeria. This study was anchored on two broad objectives:

i. To determine the extent to which the deployment of digital technologies and agricultural technologies affect the performance of the Federal Ministry of Agriculture and Food Security in Nigeria.
ii. To examine the effect of the deployment of agricultural technologies by the Federal Ministry of Agriculture and Food Security on food production in Nigeria.

Hence, two null hypotheses were tested; H1: Deployment of digital technologies and agricultural technologies has no significant effect on performance of the Federal Ministry of Agriculture and Food Security in Nigeria, and H2: Deployment of agricultural technologies by the Federal Ministry of Agriculture and Food Security has no significant effect on food production in Nigeria.

Literature Review

Conceptual Clarifications

Technology

Technology is a Greek word derived from the synthesis of two words 'techie' (meaning Art) and 'logos' (meaning logic or science), hence technology means the art of scientific discipline (Bayo,2019). Technology as a concept is intangible, and very difficult to observe, understand and assess. The definitions, applications, and comprehension vary depending on the source and disciplinary setting (Malmström et al., 2017).

Technology comprises both physical and informational components, the physical component includes items like products, tools, equipment, blueprints, procedures, and processes; while the informational component includes management know-how, marketing, manufacturing, quality control, reliability, skilled labour, and functional areas (Kumar *et al.*, 1999). Grubler (2015) also agrees that technology consists of two parts: the hardware, which is the physical

component, and the software, which is the knowledge upon which the technology is based. Volti (2009) also sees technology as a human-created system that makes use of knowledge and organization to create items and processes for achieving certain goals.

Technological Deployment

Technological deployment is the process of acquiring new technologies, be it software or hardware, or updating the existing ones in an organization. It involves the generation of knowledge and processes to develop systems to solve problems and extend human capabilities (IGI-Global, 2023). The deployment process is usually kick-started in the form of suggested improvement proposals, which are subjected to a process to decide which ones to select for implementation. According to Baskarada *et al*. (2013), this process starts with agenda setting, formulation, decision-making, implementation, and ultimately the evaluation of the technology. The executives of every organization are constantly put in a position where they must decide which technologies will be the most helpful in furthering their organization's mission.

According to Sarta *et al*. (2021), in deciding which technologies to deploy, management must be intentional, taking into account the state of the organization at the time. Primary considerations while making this decision include the organization's ability to adapt the technology in terms of the supporting infrastructure, the knowledge and skills of personnel, and the available resources, and the cost-benefit analysis. Any improvement in the performance of an organization with the introduction of new technology is therefore not only due to the use of the technology but also to how the technology is integrated into the organisation (Gagnon & Dragon, 2022).

Performance

Richard *et al*. (2009) define performance as " the fulfilment of the intended mission of the organization which is obtained through good management, persistent efforts and superior governance to achieve goals". Measuring an organization's performance requires comparing its actual outputs with its intended outcomes (Short *et al*. 2007). Thus, Bhasin (2020) thinks it is a comparison of the goals and objectives of the organization with its actual performance in three distinct areas: product market performance (market share, sales, and ability to meet consumer needs), financial performance (return on assets, profits, and return on investments), and shareholders' return (total shareholders' return and economic value added). Folan (2007) believes the environment the organization operates in, the objectives and targets it sets for itself, and the relevant and recognizable features affect performance. The implication of this is that an organisation should measure its performance by the objectives it sets for itself internally considering its operating environment and not those set for it by external bodies. Thus, what is considered a measure of performance by the private sector is not the same as that of the public sector.

Digital Technologies

Mhlanga et al. (2021) describe digital technologies as a collection of system of devices like computers, sensors, and communication networks that are linked via the internet to convey data.

Digital technologies as used in this study refer to information communication technologies such as the use of mobile phone applications like WhatsApp and other social media platforms, online platforms such as the Ministry website, use of zoom, video conferencing and the like. It also includes digital devices such as the Global Positioning System (GPS), meteorological devices, and soil testing and mapping devices and other digital devices used in the agricultural sector.

Food Security

FAO (2006) examines food security from the dimensions of availability, access, utilization, and stability of food (that is there should be no risk of losing access to food due to sudden shocks).

The Federal Ministry of Agriculture and Food Security is the Public Sector Organisation with the mandate of ensuring food security in Nigeria. It is located in Abuja, Nigeria and drives the growth and development in the agricultural sector through formulation and implementation of policies that are targeted at increasing the level of food production to ensure availability, accessibility, utilization and stability of food in the country.

Agricultural Technologies

Agricultural technologies otherwise known as agro technology are products, services or applications that improve various input/output processes in the sector. Such technologies include the use of farming techniques, machinery such as tractors, planters etc. as well as digital technologies like Global Positioning System (GPS), Geographic Information System (GIS), smart agriculture, and precise agricultural automation (Chauhan, 2015).

Theoretical Framework

Technology Acceptance Model (TAM)

The current study was anchored on the Technology Acceptance Model (TAM) by Davis (1989). It relates to the use of technology by both the staff of the organisation and farmers who are the beneficiaries of the technologies deployed by the Ministry. According to the model, two factors are relevant and influence people's decisions on the use of any new technology: perceived usefulness or the belief that the technology boosts productivity; and perceived ease of use, which is the belief that the technology is simple and requires minimal effort to use. Perceived usefulness can be assessed using five different indicators: advanced productivity, benefit for the individual, effectiveness, speed of transactions, and effectiveness of the activity (Denny *et al.*, 2021). One of the strongest criticisms of the model is that it ignores social influences on technology implementation; group, social, and cultural influences that could influence technology acceptance.

Further work was done on the model in 1996 by Viswanath Venkatesh and Fred Davis to include an additional variable "External variables" and emphasis on factors such as user education, system features, user participation in the design, and the nature of the execution method (Kobiruzzaman, 2022). The implication of this model according to Talukder (2012) is that if the users do not accept a given technology, the intended outcome or benefits of

technology adoption would not be realized and the technology may even be abandoned completely. But if a newly acquired technology is perceived to boost production in a timely and effective manner, offers some benefits to the users, and is simple to use, then it would likely be embraced. Consequently, if the staff of the Federal Ministry of Agriculture and Food Security believe that a newly introduced technology will assist them in achieving the mandate of the organization, it will gain acceptance among them. This will motivate them to learn to use the technology appropriately to improve performance.

Empirical Review

This section contains a review of some past studies on technological deployment and performance of organisations. Mikalef et al. (2023) carried out a study on "Examining how AI capabilities can foster organisational performance in public organisations". The objective was to find out the effect of Artificial Intelligence (AI) capabilities on organisation performance, and mechanisms through which the effect of AI capabilities on organisation performance can be realized. The research area consists of multiple municipalities from Norway, Germany and Finland. The quantitative survey used a 7-point Likert questionnaire administered online to 197 chief digital officers and top managers from the mailing list of each country.

Data were analysed using Partial-Least –Squares and Structural Equation Modelling. Findings from the study reveal that process automation and cognitive insights positively and significantly affect performance. The study concludes that AI indirectly influences organisational performance. Manresa et al. (2021) investigated the impact of new technologies and organisational practices on operational performance with focus on Spanish manufacturing companies. The study adopted quantitative methodology using stratified random sampling. The results show that digitalization has a positive effect on operational performance, and the effect is stronger when combined with good organisational practices. They concluded that in order to fully benefit from new technologies, good organisational practices are crucial.

Van-Zyl (2020) worked on "The impact of new production technology on employee productivity in the South African workplace". The purpose of the study was to determine the impact of the acquisition and implementation of new production technologies on firm-based employee productivity. The findings show a positive impact on employee productivity, and higher employee productivity levels among 35-55 age group. This is logical since these are experienced staff who are also still in an age where they ae still very active.

Yauri (2021) conducted similar research, this time looking at how the use of technology affected the efficiency of the Nigeria Immigration Services in Kebbi State Command. Out of the total four hundred and sixty-five (465) employees at the command, two hundred and fourteen (214) were randomly selected to fill out questionnaires. Data were analysed using descriptive statistics, and a regression analysis. The study concludes that investing in new information technology infrastructure and training employees is a priority and called for sufficient funds to support these endeavours. The study relied on only the perception of staff of the organisation to draw its conclusion; a more credible inference could have been drawn if the views of their customers were also sampled.

Oyewole (2019), worked on "Technology Adoption and Performance of Nigerian Ports". The purpose of the study was to investigate the relationship between technology and corporate performance of the seaports in Nigeria. The primary data for the study were obtained from thirty (30) employees working in the six ports in Nigeria. Using the SPSS version 17.0, frequencies were computed to show the characteristics, and chart exhibited on the study variables at the primary level of analysis. Subsequently, at the secondary level of analysis, inferential statistics such as Pearson product moment correlation were used to ascertain the nature and direction of the proposed relationship and for testing the stated hypotheses. The results of the study reveal a positive and significant relationship between the dimensions of technology adoption and the measures of corporate performance. Based on the above findings, it was concluded that the adoption of technology would help in the increase of performance of the ports in Nigeria.

The study therefore recommends that Port managers should improve on the service quality of their ports by encouraging the use of more modern communication devices to improve performance of the ports. Onikoyi et al. (2022) also analysed the impact of information and communication technology on Nigeria Bottling Company's organizational performance. The study adopted the descriptive survey research design. The population of study was Nigeria Bottling Company 3,746 employees in the South West States of Nigeria. Purposeful sampling technique was used to select a sample size of 385. The data analysis was done using multiple regression and correlation analysis.

The results show that ICT has a substantial impact on organisational performance; internet access has a significant impact on organizational performance; and there exists a strong association between cloud computing and organizational performance. The study recommends increased investment in ICT resources.

Methodology

This study employed quantitative research design through the administration of structured questionnaires because it has the strength of providing empirical evidence on patterns with which variables present themselves in research settings, as well as the relationship between the variables (Creswell & Creswell, 2022; Rahman, 2017). Furthermore, the results obtained from quantitative research designs are more generalizable to a wider population of the research setting (Polit and Beck, 2010). The population of the study consists of the four thousand, one hundred and eighty-four (4,184) staff of the Federal Ministry of Agriculture and Food Security (FMAFS). However, a sample size of 352 was obtained by applying the sample size formula by Krejcie and Morgan (1970). This formula was applied using the Online Sample Size Calculator provided by Calculator.net (2023), at a 95% confidence interval, and based on a 5% margin of error. The sample was drawn using the stratified random sampling to ensure the respondents cut across the technical, administrative and accounts Departments in the Ministry and also comprises more of the operational staff. Hence, the sample comprises of 222(63%) technical staff, 98 (28%) administrative staff, and 32(9%) accounts staff. However, only 310 of the questionnaires were returned valid and used for the analysis.

The survey data was analysed using statistical and econometric techniques, converting categorical data into continuous variables. The crucial threshold for all analyses was set at 3.5, with an average of 3.0 on the Likert scale evaluations indicating an "undecided" response. The research objectives were examined, and hypotheses tested using inferential statistics through a multivariate regression model. The analyses were conducted using the Statistical Package for Social Sciences (SPSS version 27).

Data Analysis and Discussion of Findings

The analysis of data and discussion of findings are as presented below for each objective:

Objective 1*:* To determine the extent to which the deployment of digital technologies and agricultural technologies affect the performance of the Federal Ministry of Agriculture and Food Security in Nigeria. The technologies deployed in FMAFS were examined from two dimensions in order to examine their effects on the performance of the Ministry. First the digital technologies deployed within the Organisation to aid its management processes (Table1. 1), and agricultural technologies deployed by FMAFS targeted at boosting the level of food production in the country (Table1. 2).

Table 1: Mean Responses on Level of Deployment of Digital Technologies within the Ministry

Technology Deployed Within the Ministry	Mean Responses	Remark	Rank
Functional and updated website	4.04	High	2
WhatsApp	4.18	High	1
Other social media	3.55	Moderate	5
Video conferencing	3.69	Moderate	4
Other digital platforms	3.91	Moderate	3
Aggregate Technology Deployment within the Ministry	3.875	Moderate	--
A critical mean response of 3.5 was used to identify moderate or high levels of deployment			

Source: Author's computation with SPSS 27.0.

The mean responses presented in Table 1.1 show that there are high or moderate levels of deployment of digital technologies within the Federal Ministry of Agriculture and Food Security (FMAFS). This is indicated by the mean responses all exceeding 3.5, which is midway between the "undecided" response option (rated 3) and the "agree" response option (rated 4). Both WhatsApp and a functional and updated website have mean responses greater than 4.0. Thus, both information and communication technologies (ICTs) have high levels of deployment within the Ministry. The other digital technologies had mean responses between 3.5 and 3.99, indicating a sizeable proportion of staff either "disagreed", "strongly disagreed", or were undecided as to the level of use of these technologies in the organisation. Thus, it is concluded that these technologies have moderate levels of deployment within the FMAFS.

Table 2: Mean Responses on Level of Deployment of Technology by the Ministry for Food Production

Technologies Deployed for Food Production	Mean Responses	Remark	Rank
Improved seeds and livestock breeds	4.01	High	2
Tractors and modern farm machinery	3.85	Moderate	5
Online dissemination of agricultural research innovation	3.81	Moderate	7
Online distribution of farm inputs	3.74	Moderate	8
Modern meteorological devices	3.83	Moderate	6
Soil testing and mapping kits	3.93	Moderate	3
Global positioning system	3.90	Moderate	4
Smart agriculture	4.04	High	1
Ministry's Aggregate Technology Deployment for Food production	3.891	Moderate	--
A critical mean response of 3.5 was used to identify moderate or high levels of deployment			

Source: Author's computation with SPSS 27.0.

Table 2 shows the mean responses of specific agricultural technologies targeted at improving the level of food production in Nigeria. This indicates a moderate aggregate deployment with a mean of 3.891. However, the technology deployed for food production even though moderate is still slightly higher than those deployed within FMAFS to aid its management processes (3.875).

Table 3: Regression Modelling of the Performance of FMAFS

Dependent Variable: Performance of the FMAFS.			
Variables	**β**	***p***	**Remark**
(Constant)	1.419	0.000	--
Aggregate technology deployment within the Ministry	0.018	0.700	Insignificant
Ministry's aggregate technology deployment for food production	0.649	0.000	**Significant**
Model Summary and Performance			
R-squared	0.630		
Adjusted R-squared	0.628		
F-statistic (p-value)	261.788 ($p < 0.001$)		
Maximum VIF	1.571		
Durbin Watson Statistic	2.046		
variables with p-values < 0.05 are significant (boldened)			
FMAFS: Federal Ministry of Agriculture and Food Security			

Source: Author's computation with SPSS 27.0

The results presented in the model summary and performance in Table 3 above, show that the interactions between both dimensions of technology deployment form a significant model as indicated by the p-value ($p < 0.001$) of the F-statistic of 261.788. Thus, the obtained R-squared and the adjusted R-squared are significant. This indicates that interactions of both technology deployment dimensions explain 62.8% – 63.0% of the changes in the level of performance of

the FMAFS. The diagnostic tests of violations of the OLS assumptions indicate that the estimated model does not have error terms that are auto correlated. This is shown by the Durbin-Watson statistic of 2.046 being close to 2.0. Furthermore, the maximum Variance Inflation Factor (VIF) was found to be 1.571 which falls below the benchmark, indicating the absence of multicollinearity.

This indicates that the estimated regression model is not spurious. Thus, the null hypothesis of no significant effect of technology deployment on the performance of the Organisation is rejected. This result is in agreement with the work of Mikalef *et al*. (2023), who carried out a study on "Examining how AI capabilities can foster organizational performance in public organizations.

Objective 2: To examine the effect of the deployment of agricultural technologies by the Federal Ministry of Agriculture and Food Security on food production in Nigeria.

Table 4: One-Sample T-tests of Perceived Effects of Technologies Deployed on Food Production

Effects of Technologies Deployed on Food Production	**Mean Responses**	**t-value**	**p-value**	**Remark**
Effect of improved crop varieties	4.02	12.439	**0.000**	Significant effect
Effect of improved livestock breeds	4.07	12.403	**0.000**	Significant effect
Effect of farm machineries	3.99	10.548	**0.000**	Significant effect
Effect of using agricultural research innovation	4.11	13.268	**0.000**	Significant effect
Improved farmer resilience by using meteorological devices	4.02	10.648	**0.000**	Significant effect
Effect of soil testing and mapping kits	3.97	9.286	**0.000**	Significant effect
Digital platforms improve pest and disease awareness	4.04	11.518	**0.000**	Significant effect
Improved farming choices from e-extension platforms	3.95	8.050	**0.000**	Significant effect
Effect of online distribution of farm inputs	3.85	7.430	**0.000**	Significant effect
Aggregate effect on food production	4.00	13.817	**0.000**	Significant effect
Mean ratings compared to 3.5 as the critical value				
boldened p-values < 0.05 indicate that the perceived effect is significant				

Source: Author's computation with SPSS 27.0.

On aggregate, the effect of all the technologies on food production was found to be high, given its mean response of 4.00 (see Table 1). The effects were also tested for significance, to ensure that the mean ratings are not spurious or due to chance. Hence, the t-values and their p-values are also reported in Table 4. It can be seen that the most significant effect stems from the use of agricultural research innovation ($t = 13.268; p < 0.000$) in line with its highest mean rating of 4.11. This relevance of the T-test is underlined by the higher level of significance of the effect of improved crop varieties, despite being ranked 4th and having a lower mean (4.02) compared to the higher mean of 4.07 for effects of rearing improved livestock breeds (ranked 2nd). As such, the T-test indicates that the 2nd most significant effect is from improved crop varieties, as it has the 2nd highest t-value ($t = 12.439; p < 0.000$).

In view of these, the two most significant perceived effects stem from using agricultural research innovation, growing improved crop varieties based on their t-values. It is also noteworthy that the aggregate effect of these technologies was found to be significant ($t = 13.817; p < 0.000$), even more so than the individual effects from the specific technologies. As seen, it has a t-value higher than that of all the individual effects. With the aggregate mean response of 4.0, it indicates that the overall effect of these technologies on food production is perceived to be significantly high. This is expected given that the mean responses deviate a lot from 3.5, ranging from 3.85 as the lowest, to as high as 4.11.

The significance of the effect of technology deployment in the FMAFS on food production was measured. The aggregate effect of technology deployment on food production was regressed on the aggregate technology deployment for food production. The estimated regression model is presented in Table 5. The results presented in Table 5 confirmed to the a priori expected signs, as the variable had a positive beta values and significant with a p-value that falls below 0.05. Thus, the positive impact of technology deployment for food production is associated with a 0.622 increase in the level of food production as the outcome variable.

Table 5: Regression of Food Production on Technology Deployments

Dependent Variable: Level of Food Production			
Variables	***β***	***P***	**Remark**
(Constant)	1.271	0.000	--
Ministry's aggregate technology deployment for food production	0.622	0.000	**Significant**
Model Summary and Performance			
R-squared	0.602		
Adjusted R-squared	0.599		
F-statistic (p-value)	232.220 (p < 0.001)		
Maximum VIF	1.571		
Durbin Watson Statistic	2.141		
variables with p-values < 0.05 are significant (boldened)			

Source: Author's computation with SPSS 27.0

The estimated model had an R^2 of 0.602 and an adjusted R^2 of 0.599. This indicates that the estimated model explains between 59.9% – 60.2% of the variation in food production. This is validated by the F-statistic of 232.20, which has a very significant p-value *($p < 0.001$)*. The Durbin-Watson statistic of 2.141 is close to 2, indicating that the error terms are not auto correlated. The highest VIF of 1.571 falls below 5.0, showing that the estimated model does not have multicollinearity. This indicates that the regression model is not spurious but can be used to meaningfully predict the level of food production.

Thus, the effect of the deployment of agricultural technologies by the Federal Ministry of Agriculture and Food Security on food production in Nigeria is significant. This result agrees with the findings of Manresa *et al*. (2021), who investigated the impact of new technologies and organizational practices on operational performance with a focus on Spanish manufacturing companies.

Conclusions

The study was on the effect of technological deployment on performance in the Federal Ministry of Agriculture and Food Security (FMAFS), Nigeria. Based on the findings, there is high to moderate levels of deployment of digital technologies within the FMAFS, with WhatsApp and a functional website being the most deployed. However, the aggregate agricultural technologies deployed for food production was slightly higher than the digital technologies deployed within FMAFS to aid its management processes. In addition, the interaction of both dimensions of technology deployments in the FMAFS was found to have a significant positive effect on the Ministry's performance. Furthermore, the study found that agricultural technologies have significant effect on food production in Nigeria. Deployment of agricultural research innovations and improved crop were particularly found to be very effective in enhancing food production.

Recommendations

Based on the findings, the study proposed the following recommendations:

1. Enhanced Deployment Strategy: The Ministry should consider enhancing the deployment of digital technologies, particularly those with proven positive impacts on performance. This could involve further training for staff and better integration of these technologies into daily operations.
2. Focus on Effective Technologies: Given the varying impact of different technologies, the Ministry should prioritize the deployment of technologies that have been shown to have the most significant positive effects on performance especially in the area of food production.
3. Increased Investment in Agricultural Technologies: To further improve food production, the Ministry should increase its budgetary provision for agricultural technologies such as improved crop varieties and livestock breeds, and agricultural research innovations. This could involve partnerships/synergy with research institutions, farmers 'associations and the private sector.

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