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Effect of Digital Marketing Proxies on Agricultural Product in Developing Economies

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ABSTRACT

This study investigates the effect of digital marketing proxies (social media marketing, email marketing, search engine optimization, and content marketing) on agricultural product marketing in developing economies. It intends to examine the influence of social media marketing on consumer awareness of agricultural products, and also to Investigate the role of email marketing in building customer relationships in agricultural marketing. A descriptive survey design was adopted, and data were collected from 250 agribusiness stakeholders in Nigeria. The analysis combined descriptive statistics, Chi-square tests, and multiple regression. The Chi-square results revealed significant associations between digital marketing proxies and agricultural marketing outcomes ($\chi^2 = 24.6$, $p < 0.05$). Regression analysis further showed that social media marketing ($\beta = 0.32$, $p < 0.01$), email marketing ($\beta = 0.28$, $p < 0.01$), SEO ($\beta = 0.35$, $p < 0.001$), and content marketing ($\beta = 0.30$, $p < 0.01$) jointly explained 64% of the variance in agricultural marketing effectiveness ($R^2 = 0.64$, $F = 35.6$, $p < 0.05$). These findings demonstrate that digital marketing proxies significantly enhance product visibility, consumer engagement, and sales growth. The study concludes that digital marketing is a viable panacea for agricultural marketing challenges in developing economies and recommends policy support and farmer capacity building to foster wider adoption.

***Keywords*— Agricultural Marketing, Content Marketing, Developing Economies, Digital Marketing, Social Media.**

I. INTRODUCTION

Agriculture remains the backbone of most developing economies, playing a crucial role in sustaining livelihoods, ensuring food security, and supporting industrial development through the provision of raw materials. In many countries across Africa, Asia, and Latin America, the majority of the population depends directly or indirectly on agriculture for survival, either through farming activities or agro-related enterprises. Beyond its contribution to employment, agriculture is central to poverty alleviation, rural development, and national economic growth. Despite this enormous significance, agricultural product marketing continues to experience persistent challenges that hinder its effectiveness and overall

contribution to development. Among these challenges are poor access to markets, weak linkages between producers and consumers, low consumer awareness about agricultural products, and inefficiencies in the traditional marketing channels that dominate rural and semi-urban communities (FAO, 2021; World Bank, 2022). These constraints often result in reduced profitability for farmers, post-harvest losses, and limited competitiveness in both local and international markets.

In response to these long-standing challenges, digital marketing has emerged in recent years as a transformative solution with great potential to reshape agricultural product marketing. Digital marketing, through its unique capacity to facilitate real-time communication, broaden product reach beyond local boundaries, and provide cost-effective promotional tools, offers opportunities that traditional marketing methods cannot. Farmers and agribusinesses are increasingly exposed to innovative platforms that enable them to connect directly with consumers, share product information, and receive instant feedback. These opportunities, if well utilized, can bridge the gaps of market asymmetry, reduce dependency on middlemen, and enhance transparency in agricultural value chains (Adegbite & Ojo, 2023).

Digital marketing proxies such as social media platforms, email marketing, content marketing, and search engine optimization (SEO) have already revolutionized the ways in which businesses promote goods and services on a global scale (Kotler et al., 2020; Chaffey & Ellis-Chadwick, 2022). Social media, for instance, allows farmers to showcase products directly to potential buyers, while SEO tools make agricultural enterprises more visible in competitive online spaces. Similarly, email marketing and content creation provide cost-effective avenues for building consumer trust and maintaining customer relationships. These tools have proven effective across various sectors of the global economy, helping small and large businesses alike to compete in increasingly dynamic markets (Kumar et al., 2021).

However, the adoption of digital marketing in agricultural product promotion within developing economies has been far from uniform. A range of infrastructural, financial, and knowledge-related constraints continues to limit its widespread application. Issues such as poor internet connectivity, high costs of digital devices, low levels of digital literacy among farmers, and inadequate institutional support remain pressing barriers (Ndaghu & Mohammed, 2022; UNCTAD, 2023). These challenges raise critical questions about the extent to which digital marketing proxies can genuinely influence agricultural product marketing in resource-constrained settings.

A. Conceptual Review

Digital marketing refers to the use of online platforms and digital technologies to promote, distribute, and sell goods and services to targeted audiences (Ryan, 2016). Unlike traditional marketing, which often depends on physical methods such as print media, radio, or face-to-face interactions, digital marketing takes advantage of the internet and mobile technologies to reach broader markets at lower costs. It involves an array of tools and strategies, including social media platforms, email campaigns, websites, content creation, search engine optimization (SEO), and pay-per-click advertising, all of which are designed to increase visibility, foster engagement, and drive consumer decision-making (Chaffey & Ellis-Chadwick, 2022).

One of the unique advantages of digital marketing lies in its interactive nature. Unlike conventional approaches, it enables real-time communication between businesses and consumers, offering opportunities for instant feedback, personalized services, and stronger brand-customer relationships (Kotler et al., 2020). Analytics and digital tracking tools also allow businesses to measure performance more accurately, refine strategies, and adapt to market demands with greater flexibility.

Within agriculture, the relevance of digital marketing is steadily growing. Farmers and agribusinesses can now use digital platforms to advertise products, share timely information about availability and pricing, and access distant markets that were previously out of reach. By leveraging tools like Facebook, Instagram, and WhatsApp, agricultural producers bypass traditional intermediaries, thereby reducing transaction costs and improving profitability (Tiago & Veríssimo, 2014; Adegbite & Ojo, 2023). Similarly, email newsletters, blogs, and online marketplaces help build consumer trust, promote transparency, and enhance traceability across the food value chain (UNCTAD, 2023). In essence, digital marketing is not merely an alternative to traditional approaches but a transformative force that reshapes how businesses—particularly in agriculture—connect with markets, create value, and sustain competitiveness in today's digital economy.

B. Social Media Marketing

Social media marketing refers to the use of digital platforms such as Facebook, Instagram, Twitter (now X), and WhatsApp to promote products, engage with customers, and build brand visibility. These platforms provide an avenue for farmers and agribusinesses to reach wider audiences beyond their immediate geographical boundaries, showcase products through images and videos, and interact directly with potential buyers in real time (Kaplan & Haenlein, 2019). Compared to traditional methods, social media marketing is cost-effective, highly interactive, and accessible even to small-scale farmers with

limited resources. In agriculture, social media serves not only as a promotional tool but also as a space for information exchange, knowledge sharing, and community building. Farmers can use these platforms to advertise produce, announce availability, negotiate prices, and even receive feedback from customers (Ogunleye & Akinbode, 2020). Research indicates that social media marketing enhances consumer awareness, fosters engagement, and strengthens trust between producers and consumers (Dwivedi et al., 2021). Furthermore, its interactive nature enables two-way communication, which is essential in creating loyal customer bases. Overall, social media marketing has emerged as a vital strategy for modern agribusiness, offering farmers the opportunity to bypass traditional middlemen, reduce marketing costs, and improve profitability in increasingly competitive markets (Adegbite & Ojo, 2023).

C. Email Marketing

Email marketing is one of the most widely used digital marketing strategies for fostering direct communication between businesses and consumers. It involves sending targeted messages, newsletters, promotions, and personalized offers directly to the customer's inbox, making it a powerful tool for maintaining long-term relationships (Chaffey & Ellis-Chadwick, 2019). Unlike social media, which is often crowded and competitive, email marketing allows businesses to reach audiences in a more controlled and personalized environment.

In the agricultural sector, email marketing has unique advantages. Farmers and agribusinesses can use email newsletters to share timely updates about product availability, seasonal harvests, prices, and even farm stories that build trust and authenticity. Personalized campaigns—such as offering discounts to loyal customers or reminders for recurring purchases—help strengthen customer loyalty and encourage repeat patronage (Kumar et al., 2021). For exporters and larger agribusinesses, email also serves as an efficient channel for maintaining relationships with distributors, retailers, and wholesalers across different regions.

D. Search Engine Optimization (SEO)

Search Engine Optimization (SEO) refers to the process of improving a website's visibility on search engines such as Google, Bing, and Yahoo in order to increase traffic and attract potential customers. It involves the strategic use of keywords, metadata, backlinks, and user-friendly design to ensure that a website ranks higher in search results (Baye et al., 2016). In essence, SEO makes it easier for consumers to discover products and services online, which is particularly critical in today's digital economy where visibility often translates directly into competitiveness and sales.

For agriculture, SEO offers farmers and agribusinesses the opportunity to showcase their products beyond local markets, reaching national and even global audiences. By optimizing websites with relevant

agricultural keywords—such as "organic vegetables near me" or "export-quality cocoa beans"—producers can connect with buyers actively searching for such products (Dwivedi et al., 2021). Studies suggest that effective SEO strategies not only increase website traffic but also significantly enhance customer trust, as users tend to perceive higher-ranked websites as more credible and reliable (Järvinen & Taiminen, 2022).

E. Content Marketing

Content marketing is a strategic approach that focuses on creating and distributing valuable, relevant, and consistent content to attract and engage target audiences (Pulizzi, 2014). Unlike traditional advertising, which emphasizes direct promotion, content marketing aims to build long-term relationships by providing information that educates, entertains, or solves customer problems. Common forms include blog articles, videos, podcasts, infographics, and tutorials, all designed to increase consumer knowledge while subtly promoting products or services (Chaffey & Ellis-Chadwick, 2022).

In agriculture, content marketing plays a crucial role in bridging the information gap between producers and consumers. Farmers and agribusinesses can use blogs to share insights on farming practices, sustainability, and food safety, which enhances consumer confidence in their products. Similarly, videos and infographics can demonstrate product benefits—such as freshness, nutritional value, or organic certification—thereby influencing purchasing decisions (Pulizzi & Barrett, 2021). By offering educational content, producers not only strengthen customer trust but also position themselves as credible and transparent market players (Järvinen & Taiminen, 2022).

F. Theoretical Review

The integration of digital marketing proxies into agricultural product marketing can be explained through several theoretical frameworks that highlight technology adoption, consumer behavior, and communication dynamics. One of the most relevant is the Technology Acceptance Model (TAM) developed by Davis (1989), which has been widely applied to digital technologies. TAM posits that an individual's intention to adopt technology is shaped by perceived usefulness and perceived ease of use. In agricultural marketing, farmers' willingness to embrace tools such as social media, search engine optimization (SEO), and email marketing depends on whether they find these platforms beneficial in reaching customers and whether the platforms are easy to operate (Dwivedi et al., 2021). This model is particularly useful in developing economies, where digital literacy and infrastructural limitations remain significant challenges.

Another theoretical lens is Diffusion of Innovations Theory (Rogers, 2003), which explains how new technologies spread within a social system. The adoption of digital marketing among farmers follows stages of awareness, interest, evaluation, trial, and adoption. Early adopters of tools such as Facebook marketing or content creation often influence peers within their communities, thereby accelerating adoption rates. Recent studies have demonstrated that digital marketing adoption in agriculture is positively correlated with peer influence and social learning (Abubakar et al., 2021).

The Resource-Based View (RBV) also provides a strong framework for understanding digital marketing in agriculture. RBV emphasizes that firms can achieve competitive advantage by leveraging unique, valuable, and inimitable resources (Barney, 1991). In this context, digital marketing proxies serve as strategic resources that enhance visibility, reduce dependency on intermediaries, and build consumer trust. For smallholder farmers, digital platforms provide cost-effective means of differentiation and market penetration (Adegbite & Ojo, 2023).

G. Empirical Review

Empirical studies consistently highlight the positive role of social media in agricultural marketing. Ogunleye and Akinbode (2020) examined agribusinesses in Nigeria and found that platforms like Facebook and WhatsApp enabled farmers to bypass intermediaries, thereby reducing transaction costs and expanding market reach. Similarly, Adegbite and Ojo (2023) revealed that social media adoption among smallholder farmers improved visibility and customer interaction, though challenges such as poor connectivity and limited digital literacy hindered effectiveness. Beyond Nigeria, Abubakar et al. (2021) reported that Kenyan farmers using social media experienced increased sales and stronger consumer loyalty due to personalized engagement. These findings affirm that social media enhances both awareness and trust in agricultural products across developing economies. Dwivedi et al. (2021) demonstrated that personalized email campaigns significantly increased customer loyalty and repeat purchases across multiple sectors, insights that extend to agriculture.

The main objective of the study is to assess the effect of digital marketing proxies on agricultural product in developing economies. The specific objectives are to find out the influence of social media marketing on consumer awareness of agricultural products and investigate the role of email marketing in building customer relationships in agricultural marketing. The following null hypotheses were formulated for the study:

H01: Social media marketing has no significant influence on consumer awareness of agricultural products.

H02: Email marketing has no significant role in building customer relationships in agricultural marketing.

II. MATERIALS AND METHODS

The study adopted a descriptive survey design to capture respondents' perceptions and practices regarding digital marketing proxies.

A. Population and Sample Size

The population consisted of agribusiness owners, marketers, and consumers in Nigeria. Using Cochran's formula, a sample size of 250 respondents was selected.

B. Data Collection Instrument

Structured questionnaires were distributed to capture information on respondents' demographics, digital marketing usage, and marketing outcomes.

C. Method of Data Analysis

Data were analyzed using descriptive statistics (mean, frequency, percentage), Chi-square tests, and regression analysis to test hypotheses.

III. RESULTS

A. Descriptive Analysis of Digital Marketing Proxies

The descriptive statistics of the digital marketing proxies are presented in Table 1. The results indicate a high level of agreement among respondents regarding the effectiveness of digital marketing strategies in enhancing agricultural product marketing. Specifically, 72% of respondents agreed that social media marketing increases awareness, while 75% affirmed that search engine optimization (SEO) improves product visibility. Similarly, 70% of respondents agreed that content marketing boosts consumer trust, and 68% indicated that email marketing builds customer loyalty.

However, a notable proportion of respondents expressed disagreement across all variables, ranging from 17% to 21%, suggesting variability in the perceived effectiveness of these tools. Neutral responses were relatively low (8%–12%), indicating that most respondents had clear opinions on the impact of digital

marketing proxies.

B. Chi-square Analysis

The chi-square results further validate the statistical significance of selected digital marketing proxies. As shown in Table 2, social media marketing has a significant influence on consumer awareness ($\chi^2 = 24.6$, $p < 0.05$), while email marketing significantly contributes to building customer relationships ($\chi^2 = 19.2$, $p < 0.05$). These findings suggest that the observed relationships are not due to chance but reflect meaningful associations between digital marketing strategies and consumer behavior.

C. Regression Analysis

The regression results, as presented in Table 3, show the combined and individual effects of digital marketing proxies on agricultural product marketing effectiveness. All predictors—social media marketing ($\beta = 0.32$, $p = 0.001$), email marketing ($\beta = 0.28$, $p = 0.002$), SEO ($\beta = 0.35$, $p = 0.000$), and content marketing ($\beta = 0.30$, $p = 0.003$)—were found to be positive and statistically significant.

Among the predictors, SEO exhibited the strongest influence ($\beta = 0.35$), followed by social media marketing ($\beta = 0.32$), content marketing ($\beta = 0.30$), and email marketing ($\beta = 0.28$). The model's coefficient of determination ($R^2 = 0.64$) indicates that 64% of the variation in agricultural product marketing effectiveness is explained by the combined effect of these digital marketing proxies. Furthermore, the overall model is statistically significant ($F = 35.6$, $p < 0.05$), confirming the robustness of the regression model.

IV. DISCUSSION

The findings of this study provide strong empirical evidence that digital marketing proxies significantly enhance agricultural product marketing effectiveness in developing economies. The high agreement levels reported in Table 1, coupled with the statistically significant relationships observed in Tables 2 and 3, underscore the critical role of digital tools in modern agricultural markets.

Social media marketing emerged as a key driver of consumer awareness, as confirmed by both descriptive and inferential analyses. Platforms such as Facebook, Instagram, and WhatsApp enable farmers to reach wider audiences, promote their products, and interact directly with consumers in real time. This finding supports Ogunleye and Akinbode (2020), who argued that social media reduces reliance on intermediaries and strengthens customer relationships, thereby addressing information asymmetry in agricultural

markets.

Email marketing was also found to significantly influence customer loyalty and relationship building. As shown in Tables 1 and 2, a substantial proportion of respondents acknowledged its effectiveness, and the chi-square results confirm its statistical significance. This aligns with Dwivedi et al. (2021), who highlighted that personalized email campaigns enhance customer retention and repeat purchases. In resource-constrained settings, email marketing offers a cost-effective approach to sustaining long-term engagement with customers.

Search Engine Optimization (SEO) demonstrated the strongest predictive power in the regression model (Table 3), indicating its critical role in improving product visibility. By increasing the discoverability of agricultural products online, SEO enables agribusinesses to attract organic traffic and expand their market reach. This finding corroborates Baye et al. (2016), who found that optimized web presence significantly improves sales performance.

Content marketing also contributed significantly to marketing effectiveness by enhancing consumer trust. Through blogs, videos, and infographics, agricultural producers can educate consumers and provide transparency about production processes. This supports the findings of Järvinen and Taiminen (2022), who emphasized the role of content-driven strategies in building credibility and influencing purchase decisions.

Finally, the results confirm that the integration of digital marketing strategies is essential for improving agricultural marketing outcomes, particularly in developing economies where traditional marketing channels are often inefficient.

Table 1: Descriptive Statistics of Digital Marketing Proxies

Digital Marketing Proxy	Agree (%)	Neutral (%)	Disagree (%)
Social Media Marketing increases awareness	72	10	18
Email Marketing builds customer loyalty	68	12	20
SEO improves product visibility	75	8	17
Content Marketing boosts consumer trust	70	9	21

Table 2: Chi-Square Analysis of Selected Digital Marketing Proxies

Variable	χ^2 Value	p-value	Decision
Social Media Marketing	24.6	< 0.05	Significant
Email Marketing	19.2	< 0.05	Significant

Table 3: Regression Analysis of Digital Marketing Proxies on Agricultural Product Marketing Effectiveness

Predictor	β	t-value	Sig.
Social Media Marketing	0.32	4.12	0.001
Email Marketing	0.28	3.85	0.002
SEO	0.35	4.56	0.000
Content Marketing	0.30	3.67	0.003

Model Summary: $R^2 = 0.64$; $F = 35.6$; $p < 0.05$

V. CONCLUSION

This study concludes that digital marketing proxies are vital in transforming agricultural product marketing in developing economies. Unlike traditional marketing methods that are often limited by geography, cost, and inefficiencies, digital tools offer scientific, scalable, and adaptable solutions to the persistent challenges of awareness, trust, and visibility. Social media platforms have proven effective in fostering awareness and creating direct connections between producers and consumers, while email marketing sustains loyalty through personalized communication and repeat engagement. Similarly, Search Engine Optimization (SEO) enhances online visibility, ensuring that agricultural products can be discovered by a wider audience, and content marketing builds trust by providing consumers with transparent, informative, and engaging material about products and production processes.

The evidence from this study, consistent with prior empirical research, highlights the transformative potential of these tools in reshaping agricultural marketing systems. However, it also reveals the limitations posed by infrastructural gaps, low digital literacy, and affordability challenges, which hinder widespread adoption in rural and resource-constrained communities. Addressing these barriers through targeted policy interventions, digital skills training, and investments in rural connectivity will be crucial for unlocking the full potential of digital marketing in agriculture.

VI. RECOMMENDATIONS

Policymakers should prioritize the creation of enabling environments that support the growth and adoption of digital agriculture through appropriate policies, infrastructure, and regulatory frameworks. In addition, farmers and agribusiness owners need to be equipped with relevant skills through targeted training in digital marketing to enhance their market reach and competitiveness. Governments should also consider subsidizing internet access in rural areas to reduce connectivity barriers and ensure inclusive participation in digital markets. Furthermore, digital literacy campaigns should be specifically designed to target smallholder farmers, empowering them with the knowledge and tools required to effectively utilize digital technologies for improved agricultural productivity and marketing outcomes.

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