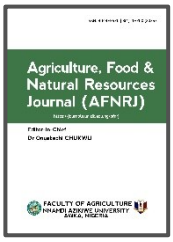
Agr. Foo. Nat. Res. J. Volume 5, Issue 1, Page 82-87

e-ISSN: 1597-7153 | p-ISSN: 3043-5420

Agriculture, Food and Natural Resources Journal

The Official Journal of the Faculty of Agriculture, Nnamdi Azikiwe University, Awka, Nigeria

Journal homepage: https://journals.unizik.edu.ng/afnrj



Original Article

Constraints to the export performance of agro-based manufacturing firms in Nigeria

OPEN ACCESS

Iveren Evelyn AKER*

Department of Agribusiness, Joseph Sarwuan Tarka University, Makurdi, Benue State, Nigeria

DOI: https://www.doi.org/10.5281/zenodo.20580157

Editor: *Dr Onyekachi Chukwu, Nnamdi Azikiwe University, NIGERIA*

Received: *August, 25 2025*
Accepted: *March 9, 2026*
Available online: *March 31, 2026*

Peer-review: *Externally peer-reviewed*

Conflict of Interest: *The authors have no conflicts of interest to declare*

Financial Disclosure: *The authors declared that this study has received no financial support.*

A B S T R A C T

This study evaluated the factors that hinder Nigerian agro-based firms' export performance. The probability proportional to size (PPS) selection approach was used to choose a sample of 127 agro-based enterprises from the functional 186 firms for this study to accomplish this goal. This study's goal was accomplished through the application of principal component analysis. According to empirical findings, Asia accounted for 46.46%, while the West (USA and Europe) absorbed 17% of Nigeria's agro-based product exports. The result of the principal component analysis indicates that 51.22% of the variance was explained by four variables. Production and marketing restrictions make up the first factor (26.41%), followed by human capital and infrastructure constraints (9.20%), administrative or institutional constraints (8.22%), and financial constraints (7.39%). The study concludes that the export of the nation's agro-based products is constrained by production and marketing, human capital and infrastructural challenges, and administrative/institutional challenges. The study recommends that government-sponsored programs should be improved and made more sustainable to help exporters and agro-based manufacturing companies to raise the quality of their goods. For Nigerian goods to satisfy international standards, these issues necessitate the upgrading of the power supply and the removal of administrative bottlenecks.

K E Y W O R D S : *Agro-based, Constraints, Export performance, Firms, Nigeria*

INTRODUCTION

Nigeria's economy depends heavily on the agro-based manufacturing sub-sector, which generates revenue, jobs, and foreign exchange through the export of agricultural goods. However, the sector's potential is constrained by numerous obstacles that prevent it from operating at its best and achieving the anticipated benefits of agro-based manufacturing. For example, Nigeria lost billions of dollars in foreign earnings when its agricultural products were recently rejected and placed on a blacklist in international markets, primarily as a result of the spread of substandard products and pesticide residue (Alawode, 2025; Irtwange, 2025)

In attempts to address these challenges in the past, several initiatives such as the establishment of marketing boards, the creation of the Nigerian Export Promotion Council (NEPC), and the Zero Reject Initiative were initiated, aimed at facilitating exports through the provision of technical support to exporters, information on product sourcing, and simplification of export procedure among other mandates (FGN, 2021; Alawode, 2025). Despite these noble initiatives, exports by agro-based manufacturing firms and agro-based products remained constrained by issues ranging from market access barriers, inadequate market infrastructure, logistic challenges, the inability of Nigeria's export commodities to meet international standards, limited access to finance, inconsistent and unfavourable policy environment (including financial and monetary policies), inadequate market information and research

*Corresponding author: torevelyn73@gmail.com

to explore the opportunities in export markets (Awolaja & Okedina, 2020).

The government has created action plans and framework over the years to accomplish the growth and development of the agro-based industry as a whole. These include the creation of agro-based processing-focused initiatives like the Nigerian Export-Import Bank (NEXIM), the Calabar Export Processing Zone, and the sugar factories at Numan, Lafiagi, and Sunti (NEXIM, 2024). To support agriculture and agro-based enterprises, the Nigerian Agricultural and Co-operative Bank was founded in 1973 and offers financing facilities. To facilitate business access to finance, the Agricultural Finance Guarantee Scheme (ACGS) lending policies were also reformed (CBN, 2021). Between 2009 and 2013, the bank provided N6.6 billion naira in funding to export companies engaged in agro-processing (Gabriel, 2015).

Nigeria still struggles to process agricultural raw materials for both export and domestic industrial use, which limits the sector's potential contribution to GDP. Much of the country's agricultural output is exported in raw form due to inadequate agro-processing capacity, poor infrastructure, and limited value addition, resulting in lost opportunities for higher income, employment, and industrial growth. Consequently, Nigeria has also not fully taken advantage of the opportunities offered by the African Continental Free Trade Area (AfCFTA), which could expand markets for processed agricultural products if stronger value chains, processing facilities, and supportive policies were in place. Strengthening agro-processing and value addition is therefore essential for boosting agricultural productivity, increasing GDP contribution, and enabling Nigeria to benefit more effectively from continental trade

The export level of agro-based products has not been able to absorb a significant portion of the labour force and has not succeeded in raising their income levels. The agro-based sector has not yet fulfilled its projected role of enhancing productivity (Abdullahi *et al.,* 2021). Expanding the agro-based sector's export potential is important to lower trade and current account deficits, at least to the degree that several developing nations, like Malaysia, which has seen rapid growth, have done. Approximately 98% of agricultural products in affluent nations are processed industrially, adding roughly US$40 in value (World Bank, 2024; African Development Bank Group, 2015). But in poorer nations, where processing accounts for only 30% of agricultural output, this is not the case (Aragie *et al.,* 2023; Kingsley, 2016).

The agro-based industry has not fulfilled its expected role in enhancing productivity, as the export of agro-based products has neither absorbed a significant portion of the labor force nor increased their income levels. To reduce trade and current account deficits, it is necessary to expand the export potential of the agro-based industry, as demonstrated by rapidly growing developing countries such as Malaysia. In high-income countries, industrial processing contributes approximately US$40 to the value of 98% of agricultural products. In contrast, in developing countries, processing accounts for only 30% of agricultural output (Aragie *et al.,* 2023; Kingsley, 2016).

Existing literature has devoted relatively limited attention to the performance of agro-based enterprises. In Nigeria in particular, empirical evidence on agro-based production and the sector as a whole remains limited, especially regarding the challenges that agro-based businesses encounter in competing and succeeding in international markets. This study contributes empirical evidence on the obstacles to the export performance of agro-based firms to the body of literature by focusing on the specific case of Nigeria, which is the study's primary purpose, and has not been specifically studied in Nigeria. This study is timely given Nigeria's efforts to bridge these gaps, especially since it will serve as a basis for creating and evaluating effective economic policies that promote the growth of exports, especially exports of agro-based goods.

METHODOLOGY

The study was conducted in Nigeria, a sovereign country in West Africa, officially known as the Federal Republic of Nigeria, with thirty-six states and the federal capital territory, Abuja. With about 233 million people, Nigeria is the most populous nation in Africa and the sixth most populous country in the World (www.worldometers.info). The agricultural products of Nigeria can be divided into two main groups: food crops, produced for home consumption, and export products. Major crops include sesame, beans, cassava, cashew nuts, cocoa beans, groundnuts, kola nut, melon, maize (corn), millet, palm kernels, palm oil, plantains, rice, rubber, sorghum, soybeans, and yams. The most important food crops are yams and manioc (cassava) in the Southern part and sorghum (Guinea corn) and millet in the Northern part. Whereas cocoa is the principal non-oil foreign exchange earner, rubber is the second leading non-oil foreign exchange earner in Nigeria.

Sampling Procedure and Sampling Size

According to the Nigerian Export Promotion Council, there were 325 registered agro-based exporting companies as at the time this research was carried out (NEPC, 2024). 186 agro-based exporting companies were available for this investigation. The probability proportion to size (PPS) sampling approach was used to pick a sample of 127 agro-based enterprises from the functional 186 firms (Nyariki, 2009). As is common in agricultural socio-economic research, a sample with a 95% confidence level and an error margin of less than 10% is deemed representative for this study (Nyariki, 2009). The Taro Yamane method for sample size selection from a given population, developed by statistician Taro Yamane in 1967, was used to determine this sample size. The mathematical illustration of how the sample size was obtained using the Taro Yamane formula is shown below.

$$n = \frac{N}{(1+N(e)^2)} \quad (1)$$

where n = corrected sample size, N = population size, and e = Margin of error (MoE), e = 0.05 based on the research condition.

A simple random sampling technique was employed to randomly select the 127 agro-based exporting firms out of the 186 firms. In applying this technique, the names of all the firms were written on identical pieces of paper, which were folded, put in a container, and thoroughly reshuffled before a selection was made. Therefore, every firm in the population had an equal chance of being selected. Thus, it eliminates bias due to the personal judgment or discretion of the researcher. Three employees from 127 organizations were selected using purposive selection and interviewed together. Each agro-based business responded to standardized questionnaires, ensuring export managers, founders, and decision-makers were included to provide valuable information.

Primary data were collected from the selected agro-based manufacturing firms using an online questionnaire (Google Form). In the survey, the export managers, founders of the firms and individuals who make decisions or play a leading role regarding export decisions were asked to complete the questionnaire because they are expected to have the experience and perspectives necessary to provide practical information about their firm's exports of agro-based products. The data collected consisted of information on constraints to export performance.

This study utilized Principal Component Analysis (PCA) to identify constraining variables in agro-based manufacturing firms. The sum of the mean test was used to estimate the observed mean value, while the Eigenvalue was used to determine factor suitability: if the eigenvalue was greater than one, it would be considered a factor and vice versa. For $\mathbf{y}_1, \mathbf{y}_2, \ldots, \mathbf{y}_n$ in any observation vector **y**, the model is as follows:

$$\begin{cases} y_1 = \lambda_{11}f_1 + \lambda_{12}f_2 + \lambda_{13}f_3 + \cdots \ldots \ldots \ldots \lambda_{1m}f_m + \varepsilon_1 \\ y_2 = \lambda_{21}f_2 + \lambda_{22}f_2 + \lambda_{23}f_3 + \cdots \ldots \ldots \ldots \lambda_{2m}f_m + \varepsilon_2 \\ \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . \\ y_n = \lambda_{n1}f_1 + \lambda_{n2}f_2 + \lambda_{n3}f_3 + \cdots \ldots \ldots \ldots \lambda_{nm}f_m + \varepsilon_n \end{cases} \quad (2)$$

Where,
$y_1 - y_n$ = *vector of observed or known variables*
$f_1 - f_m$ = *unobservable or unknown factors*
λ_{ij} = *are referred to as loadings of the variable* y_i *on factor* f_i, *depicting how each* y_i *individually depends on depicting how each* y_i *individually depends on* f_i. $\varepsilon_1 - \varepsilon_n$ = *independent error terms*

RESULTS AND DISCUSSION

The volume and distribution of selected agro-based exports from Nigeria to different regions of the world are presented in Tables 1 where the export value of agricultural commodities served as the basis for estimating the share of exports to the various regions. The results indicate that exports from the sampled agro-based firms to the Asian region, comprising major importing countries such as China, India, Japan, Vietnam, Myanmar, the United Arab Emirates, and Malaysia were valued at approximately ₦4.91 billion, representing 41.02% of the total export volume. This finding aligns with the report by PricewaterhouseCoopers (PwC, 2019) which identified Asia as the leading destination for Nigeria's agricultural exports, accounting for about 59% of the country's total agricultural export.

In addition, exports from the selected agro-based firms to Europe and America amounted to about ₦2.36 billion, representing 19.72% of total exports. These regions ranked as the second major destinations for Nigerian agricultural commodities, particularly products such as cocoa beans, shrimp, and prawns exported to countries including the Netherlands, Germany, Belgium, the United States, and France. This result is broadly consistent with the findings of PwC (2019) and Abdullahi *et al.,* (2021), which reported that Europe and the United States accounted for approximately 34% and 3.6%, respectively, of Nigeria's agricultural exports.

Within Africa, the East African, West African, and North African sub-regions ranked third, fourth, and fifth as export destinations, accounting for about ₦2.08 billion (17.38%), ₦1.38 billion (11.61%), and ₦1.23 billion (10.28%) of total agricultural exports, respectively. However, exports to other African markets such as Southern Africa were negligible among the firms surveyed. Overall, agro-based exports to African markets accounted for 39.27% of the total export volume among the sampled firms. These findings support the general assertion that intra-African trade in agricultural commodities involving Nigeria remains relatively low compared with trade with other global regions. However, the findings of this study differ from the statistics reported by Statista (2022) on Nigeria's agricultural export values by destination region in 2021. According to Statista, Europe was the leading destination for Nigeria's agricultural exports, with a value of about ₦68.20 billion, followed by Asia with ₦55.70 billion, and America with ₦6.81 billion. In contrast, exports to Africa and Oceania were relatively small, amounting to approximately ₦1.40 billion and ₦0.57 billion, respectively. This disparity may be attributed to renewed efforts aimed at strengthening intra-African trade through various policy initiatives, including the Nigeria-Africa Trade and Investment Promotion Programme (NATIPP), the Agricultural Promotion Policy, the Zero Reject Initiative, and the African Continental Free Trade Area (AfCFTA). These initiatives are designed to promote trade liberalization, create a common market, and facilitate the free movement of Nigeria's agricultural products across African markets. Additionally, the predominance of primary or semi-processed agricultural exports from Nigeria and other African countries to non-African markets may also explain the growing importance of regional African markets, which are often more accessible to exporters.

Table 1: Volume of Exports from the Selected Agro- based Firms from Nigeria to other Regions of the World

Export Destination	Volume of Export (₦ Billion)	Percentage (%)
Europe and the USA	2.36	19.72
North Africa	1.23	10.28
East African	2.08	17.38
West African	1.39	11.61
Asian region	4.91	41.02
Total	11.59	100

Source: Field Survey, 2021

Principal Component Analysis of Constraints to Export Performance of Agro-based Firms

Analysis of the constraints to the export performance of agro-based firms in Table 2 showed the suitability of the rotational analysis with the Kaiser-Meyer-Olkin test (KMO) value of 0.758, a very commendable level, which is above the Kaiser recommended value of 0.50, indicating the adequacy of the sample for the analysis (Principal Component Analysis). The decision criterion for the use of this value is that a value of "zero" means that the sum of partial correlation is large relative to the sum of correlation, implying diffusion in the pattern of correlation; hence, factor analysis is likely to be inappropriate. While a value close to "one" indicates that the patterns of the correlations are relatively compact, thus factor analysis will yield distinct and reliable factors (Sadiq *et al*., 2018). In addition, the original correlation matrix is not an identity matrix as evidenced by Bartlett's Test of Sphericity which is significant at less than a 1% level of statistical significance. For the principal factor analysis, the varimax rotation reduced the perceived constraints to an interpretable four factors as evidenced by their respective Eigen value which is above 1.

Table 2: Principal Component Analysis of Constraints to Export Performance of Agro-based Firms

Constraints	Factor 1	Factor 2	Factor 3	Factor 4
Export quality	0.724			
Availability of raw materials	0.626			
Non- labour cost: Travel expenses, Facilities, Team building e.t.c	0.576			
Competition within international export markets	0.569			
Language proficiency	0.466			
Documentation / Paper work		0.771		
Human resources constraints: Know-how, commitment and information management		0.761		
Finding buyers overseas		0.746		
Physical infrastructure		-0.489		
Government Regulations		0.457		
Knowledge of export markets			0.726	
Electricity supply/ High electricity tariff			0.681	
Reliable supply of energy			0.617	
Administrative barriers and foreign standards			0.548	
Working capital				0.728
Finance for capital investment				0.607
Eigen values	4.225	1.472	1.315	1.183
% of variance extraction	**26.41**	**9.20**	**8.22**	**7.39**
Kaiser-Meyer-Olkin test	0.758			
Bartlett's Test of Sphericity (χ^2) (df: 120)	452.989	0.000		

Method: Verimax and Kasiser Meyer Olkin measurement greater than 0.4

The extracted four factors accounted for 51.22% of the total variance which is above the percentage recommended to be satisfactory for social science research (Bagheri & Fami, 2016). The extracted factors exclude those factors loadings whose values were less than 0.40. Thereafter, the four extracted factors were labelled as 'production and marketing constraints', 'human capital and infrastructural constraints', 'administrative or institutional constraints' and 'financial constraints. Factor 1 (F1), 'production and marketing constraints', highly loaded from five-factor loadings and accounted for 26.41% of the total variance showed agro-based manufacturing firms' concern on export quality, availability of raw materials, non-labour cost, competition within export markets and language proficiency. This implies that improvement in export quality and raw materials to meet international standards can be a catalyst in enhancing Nigeria's competitiveness in the export markets. This assertion is supported by the findings of Zaman *et al.,* (2025) that export of processed agricultural products positively influences value addition. Additionally, this concern is anchored on the numerous rejections of agro-based products from Nigeria as outlined by Alawode (2025). Factor 2 (F2), 'human capital and infrastructural constraints', which explains 9.20% of the total variance and loaded from four-factor loadings showed agro-based manufacturing firms' growing concern on documentation/paperwork, human resources constraints, finding of buyers, physical infrastructure and

government regulations. This finding implies that proper human capital and infrastructural development could bridge the widening gap between Nigeria's export potentials and reduce the consequences of gridlock that emanate from escalated haulage costs, and export prices due to degradation in the quality of produce in Nigeria. This assertion has semblance with the findings of Bekteshi (2019) that enrichment of firms' capacity through education and skills-specific training impacts positively on export performance, implying that firms' whose managers or marketing staff are educated, knowledgeable about international market and marketing and have substantial level of language proficiency can make informed decision to export when compared to their counterparts.

Factor 3 (F3), named 'administrative or institutional constraint', loaded from four-factor loadings and explained 8.22% of total variance, revealed agro-based manufacturing firms' worry about knowledge of export markets, electricity supply/high tariffs, reliable power supply and administrative barriers and foreign standards. These factors demand improvement in power supply and elimination of administrative bottlenecks that will cause Nigeria's products to meet foreign standards. This result aligns with the findings of Tadesse and Badiane (2018) who asserted that procedures and delays in customs clearing, access to finance for traders, and the strength of contractual enforcement are some of the administrative bottlenecks affecting agro-based products export. The 4th Factor (F4), named "Financial constraint", loaded from two-factor loadings and accounted for 7.39% of the total variance, showed agro-based manufacturing firms' fear regarding the paucity of working capital and financial capital for investment. This finding calls for improvement and sustainability in the provision of finances through government-sponsored programmes to help exporters and agro-based manufacturing firms improve the quality of their products. This result is akin to the suggestions of Ezeifekwuaba (2021), who urged governments of the Less Developed Nations such as Nigeria need to provide financial assistance in form or means of easy and simple accessibility to loans (credit facilities to investors) in other to boost and enhance agricultural trade.

CONCLUSION AND RECOMMENDATIONS

This study analysed the constraints associated with the export performance of agro-based manufacturing firms in Nigeria. Findings from the study revealed that the performance of Nigeria's agro-based export is constrained by production and marketing constraints (poor export quality, competition within the export market and language proficiency), human capital and infrastructural challenges (poor documentation, weak infrastructural-based and poor regulation), administrative/institutional constraints (erratic power supply, administrative barriers and foreign standards) and financial constraints. The study recommended that the Nigerian government should address the production and marketing constraints through improvement in export quality and value addition of raw materials to meet international standards, as this will enhance Nigeria's competitiveness in the export markets. Also, to address the 'human capital and infrastructural constraints', there should be proper human capital and infrastructural development by the government that could bridge the widening gap between Nigeria's export potentials and reduce the consequences of gridlock that emanates from escalated haulage cost, and export prices due to degradation in the quality of produce in Nigeria. Additionally, tackling the financial constraint should be based on improvement and sustainability in agricultural financing through government-sponsored programmes' to help exporters and agro-based manufacturing firms improve the quality of their products.

Acknowledgements

The author acknowledges the academic staff of the Department of Agricultural Economics, University of Nigeria Nsukka for providing constructive criticism, which improved the quality of the study.

Authors' Contributions

The author conceptualized the study, designed the experiment, collected data, performed data analysis, and wrote the first draft of the manuscript. The author performed literature searches and reviewed the first draft of the manuscript. The author read and approved the final draft of the manuscript.

Ethical Statement

Not Applicable

REFERENCES

Abdullahi N.M., Aluko O.A. & Huo X. (2021): Determinants, efficiency and potential of agri-food exports from Nigeria to the EU: Evidence from the stochastic frontier gravity model. *Agric. Econ. – Czech*, 67, 337–349.

African Development Bank Group (2015). African Development Report 2015 Growth, Poverty and Inequality Nexus: Overcoming Barriers to Sustainable Development

Alawode, O. O. (2025). Trend and Implications of Nigerian Crop Produce Rejection by Destination Countries (2021-2022). *International Journal of Business & Law Research,* 13(2), 8-17. https://doi.org/10.5281/zenodo.15175415

Aragie, E., Balié, J., Morales, C., & Pauw, K. (2023). Synergies and trade-offs between agricultural export promotion and food security: Evidence from African economies. *WorldDevelopment*, *172*, 106368. https://doi.org/10.1016/j.worlddev.2023.106368

Awolaja, O. G., & Okedina, I. M. (2020). Investigating the Asymmetric Effect of Exchange Rate on Agricultural Output in Nigeria,1981-2017. *Economic and Financial Review*, 58/4, 41 – 62

Bagheri, A. & Fami, H.S. (2016). Potato growers' risk perception: A case study in Ardabil

Bekteshi, S. A (2019). The impact of education and training on export performance for SMEs. *International Journal of Research in Business and Social Science*, 8(6), 272 – 277.

CBN (2021). Guidelines for the Agricultural Credit Guarantee Scheme: Agricultural Credit Guarantee Scheme Fund, C/o Central Bank of Nigeria, Abuja. March 2021. Pp10. https://www.cbn.gov.ng/out/2021/ccd/acgsf%20guidelines%20approved%20%20march%202021.pdf

Daramola, D.S. (2011). Empirical investigation of agricultural export trade in Nigeria (1975-2008): a case study of cocoa and palm kernel. *Economic and Financial Review*, 49(1), 67-90

Ezeifekwuaba, T. B. (2021). Factors Affecting International Trade Activity in Less Developed Nations: Nigeria as a Case Study. *Science Research*, 10, (3), 69-80. https://doi.org/10.11648/j.sr.20221003.13

Federal Republic of Nigeria (2021). AgroExport Ad-hoc International Committee on Zero Reject inaugurated under the Presidential Enabling Business Environment Council (PEBEC) office of the Vice President, Nov 10, 2021.

Gabriel, O (2015), How NEXIM is helping to diversify Nigerian economy from oil. https://www.vanguardngr.com/2015/03/how-neXim-is-helping-to-diversify-nigerian-economy-from-oil/

Irtwange, S. (2025). Nigeria loses $362.5 million yearly due to hazardous pesticide residues in export crops. *BusinessDay Nigeria*.

Kingsly, K.M. (2016). Sustainable Growth and Social Development Through Agribusiness Industry (June 15, 2016). http://dx.doi.org/10.2139/ssrn.2796348

NEPC (2023). No African Country among Nigeria's top export destinations in 2022. Nigeria Tribune online, Jan. 19, 2023

NEXIM (2024). NEXIM Bank: Bringing the Nigeria to the World. https://neximbank.com.ng/

Nyariki, D.M. (2009). Household Data Collection for Socio-Economic Research in Agriculture: Approaches and Challenges in Developing Countries. *Journal of Social Science*, 19(2), 91-99.

PWC, (2019). Unlocking Nigeria's Agricultural Potentials. Prince water house Coopers Limited, www.pwc.com.ng

Sadiq, M.S., Singh, I.P., Ahmad, M.M., Lawal, M., Kamaldeen, N. & Sani, T.P. (2018). Determining the perceived constraints affecting cassava farmers in Kwara State of Nigeria. *FUDMA Journal of Agriculture and Agricultural Technology*, 4(2),235-247

Tadesse, G. and Badiane, O. (2018). Determinants of African Agricultural Exports: Competitiveness of African Agricultural Exports. Africa Agriculture Trade Monitor/Report 2018. Pp 85-109

World Bank. (2024). Farming the Future: Harvesting Malaysia's Agricultural Resilience through Digital Technologies. Malaysia Economic Monitor; October 2024. © World Bank. http://hdl.handle.net/10986/42245

Yousouph, J (2022). Exporters give reasons Nigerian Agro Exports are rejected, lament profit, job loss. Shipping Position online. www.shippingposition.com.ng

Zaman, M. H., Wahyuningsih, D, Y. & Nugroho, R. Y. (2025). Agricultural value-added growth: exploring the impact of trade, inputs and environmental factors. *Journal of Agribusiness in Developing and Emerging Economies,* 1–25. https://doi.org/10.1108/JADEE-01-2025-0039