

**TECHNOLOGY ADOPTION, POST-HARVEST LOSSES AND
AGRICULTURAL PRODUCTIVITY IN NIGERIA**

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15PAF01072**

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**A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES IN
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MANAGEMENT AND SOCIAL SCIENCES, COVENANT UNIVERSITY, OTA,
NIGERIA**

FEBRUARY, 2022

ACCEPTANCE

This is to certify that this thesis is accepted in partial fulfilment of the requirement for the award of the degree of Doctor of Philosophy (Ph.D) in Economics, Department of Economics and Development Studies, College of Management and Social Sciences, Covenant University, Ota.

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DECLARATION

I, OSABOHIEN, ROMANUS ANTHONY, (15PAF01072), hereby declare that this research was carried out by me under the supervision of Prof. Isaiah O. Olurinola and Dr. Oluwatoyin A. Matthew of the Department of Economics and Development Studies, College of Management and Social Sciences, Covenant University, Ota. I attest that this thesis has not been presented either wholly or partially for the award of any degree elsewhere. All sources of data and scholarly information used in this study are dully acknowledged.

OSABOHIEN, ROMANUS ANTHONY

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CERTIFICATION

We certify that the thesis titled “**TECHNOLOGY ADOPTION, POST-HARVEST LOSSES AND AGRICULTURAL PRODUCTIVITY IN NIGERIA**” is an original study conducted by **OSABOHIEN ROMANUS ANTHONY (15PAF01072)** of the Department of Economics and Development Studies, College of Management and Social Sciences, Covenant University, Ota, Ogun State, Nigeria, under the supervision of Prof. Isaiah O. Olurinola and Dr Oluwatoyin Matthew. We have examined and found the study acceptable as part of the requirements for the award of Doctor of Philosophy (Ph.D) in Economics.

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DEDICATION

This thesis is dedicated to God almighty for His love and grace. Furthermore, this study is dedicated to my wife and daughter for support, prayers and love. Lastly, to my mother (of blessed memory) for good upbringing. May you continue to rest in the bosom of our Lord Jesus Christ. Amen.

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LIST OF ABBREVIATIONS

ATE:	Average Treatment Effect
ATET:	Average Treatment Effect on the Treated
ATT:	Average Treatment on the Treated
ATU:	Average Treatment on the Untreated
AU:	African Union
CABI:	Centre for Agriculture and Bioscience International
CIS:	Commonwealth of Independent States
CPIA:	Country Policy and Institutional Assessment
EA:	Enumeration Areas
ECOWAS:	Economic Community of West African States
EAP:	East Asia and the Pacific
EU:	European Union
FAO:	Food and Agriculture Organisation
FGD:	Focused Group Discussion
GAIN:	Global Alliance for Improved Nutrition
GDP:	Gross Domestic Product
GHS:	General Household Survey
GMM:	Generalised Method of Moments
GPZ:	Geopolitical Zones
HH:	Household
HHH:	Household Head
ICT:	Information and Communication Technology
IFAD:	International Fund for Agricultural Development
IITA:	International Institute of Tropical Agriculture
ILO	International Labour Organisation
ISA:	Integrated Survey on Agriculture
KII:	Key Informant Interview
IMF:	International Monetary Fund
IPFRI:	International Food Policy Research Institute
ITU:	International Telecommunication Union
KBM:	Kernel-Based Matching
LAC:	Latin America and the Caribbean

LGA:	Local Government Area
LSMS	Living Standard Measurement Study
MENA:	Middle East and North Africa
MPL:	Marginal Product of Labour
MNL:	Multinomial logit
NBS:	National Bureau of Statistics
NGO:	Non-Governmental Organisation
NNM:	Nearest Neighbour Matching
PCA:	Principal Component Analysis
PSM:	Propensity Score Matching
SFM:	Stochastic Frontier Model
SSA:	Sub-Saharan Africa
UN:	United Nations
UNO:	United Nations Organisation
UNICEF:	United Nations Children Emergency Fund
UNESCO:	United Nations Educational, Scientific and Cultural Organisation
SDGs:	Sustainable Development Goals
TA:	Technology Adoption
WDI:	World Development Indicators
WFP:	World Food Programme
WHO:	World Health Organisation
YPAD:	Young Professional for Agricultural Development

ABSTRACT

Nigeria's population is increasing and it is estimated to reach 400 million by 2050 with inevitable increase in the demand for food. With this population growth, the likelihood of a looming food crisis remains unavoidable except agricultural productivity is enhanced through technology adoption to match population growth. This study empirically examined the impact of technology adoption on agricultural productivity in Nigeria, utilising Wave 4 (2018/2019) of the Living Standards Measurement Studies (LSMS), Integrated Survey on Agriculture (ISA). The objective of the study is to investigate the impact of the adoption of identified elements of technology (such as ICT, fertiliser, tractorisation, herbicides, pesticides and certified crops) on agricultural productivity; examine the point(s) on the value chain where the deployment of technology is significant and the impact of the adoption of identified indicators of technology on post-harvest losses in Nigeria. The study engaged the descriptive statistics, the logit regression, the Propensity Score Matching (PSM) and the Multinomial Logit Regression (MLR) in analysing the data. The findings showed that technology adoption among farming household heads in Nigeria is relatively low, with only 31.92 percent adoption rate. The age of the household heads, location of the household heads (whether rural or urban), membership of a cooperative society, and educational level of the household heads are the significant determinants of technology adoption among farming households in Nigeria. There exists a positive and significant impact of adoption of the identified components of technology on household agricultural productivity in Nigeria. This implies that household heads who adopt technology have a higher probability of experiencing a higher level of agricultural productivity compared to non-adopters of technology. The findings also showed that information and telecommunication technology (ICT) deployment is significant for all the actors on the agricultural value chain, and that the influence of ICT is statistically significant in reducing post-harvest losses in Nigeria. Based on the findings, the study concluded that to increase agricultural productivity, enhance efficient value chain, and reduce post-harvest losses, technology adoption is essential. The study recommended that there is a need for the government to improve support mechanisms for technology adoption. For example, concerning internet access, there should be support for public internet access points and agribusiness training for farmers to foster adoption of technology to improve productivity. In addition, rate of adoption will increase if more farmers are aware of the importance of various components of technology to drive productivity. Therefore, government at all levels should strengthen their efforts to encourage farmers through the extension agents, among others, on the need to adopt various components of technology so as to increase productivity.

Keywords: Technology adoption, Agricultural Productivity, Agricultural Value Chain, ICT deployment, Post-harvest Losses.