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FACTORS INFLUENCING ADOPTION OF IMPROVED STORAGE STRUCTURES: A CASE OF MAIZE SMALLHOLDER FARMERS IN OSUKURU TOWN COUNCIL, TORORO DISTRICT

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A SPECIAL PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF AGRIBUSINESS AND EXTENSION IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

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DECLARATION

I, Adikini Cynthia Eunice, declare that this work presented in this report is my own original work, except where acknowledgment of the source is made. It has never been submitted to any university or institution of higher learning for any academic award.

Signature ..... Date ...4/11/2024.....

APPROVAL

This special project report has been submitted to the Department of Agribusiness and Extension with the endorsement of the academic supervisor.

Signature ..... PP Date 04/11/2020

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DEDICATION

I dedicate this report to my beloved parents Mr. Ochieng David and Mrs. Auma Topista for their authoritative parenting and for laying a strong cornerstone of my intellectual abilities. To my academic supervisor Mr. Appeli Saidi, for his endless efforts, support and guidance through out my research. May God reward you abundantly.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

PHLs	post-harvest losses
FAO	Food and Agricultural Organization
BUAC	Busitema University-Arapai campus
NAADS	National Agriculture Advisory Services
NGOs	Non-governmental Organizations
CBOs	Community Based Organizations
GDP	Gross Domestic Product

ABSTRACT

Agriculture is the primary source of income and livelihoods of Ugandans as It contributes over 20% to the country's GDP. Uganda's arable land is steadily decreasing, with expansion constrained by a high population growth rate. Additionally, despite the availability of modern storage technologies, adoption remains stagnant. Storage is crucial in the food supply chain, as it helps manage fluctuations in food demand and supply, ensuring food availability during periods of scarcity. However, despite its significant contribution, there is a knowledge gap regarding the types of storage utilized by smallholder maize farmers in Osukuru Town Council, Tororo District. This study, therefore, concentrated on examining the factors that influence the adoption of improved maize storage structures among smallholder maize farmers in Osukuru Town Council, Tororo District. It was a cross-sectional study that primarily employed quantitative methods to explore the dynamics of adopting these improved storage structures. In conclusion, the gender distribution among smallholder farmers in Osukuru town council shows that females constitute a majority (57.5%), compared to males (42.5%). The data also indicates that a significant majority of smallholder farmers are married (81.5%), followed by those who are widowed or widowers (10.5%), single (7.0%), and divorced (1.0%). Additionally, the education level distribution reveals that nearly half of the smallholder farmers have only a primary education (46.0%), while a substantial portion has no formal education (22.5%). A smaller percentage have completed O level (14.5%), vocational training (11.0%), A level (2.0%), or tertiary education (4.0%). The PROBIT model results indicate that several factors significantly influence the adoption of improved storage structures among smallholder maize farmers in Osukuru Town Council, focusing on factors such as age, marital status, land size, average production, access to extension services, and awareness of advanced storage technologies. Finally, it highlights the need for targeted interventions that address the specific challenges faced by smallholder farmers, including improving access to extension services and designing educational programs tailored to particular demographic groups to encourage the adoption of improved storage structures., ultimately promoting food security and reducing post-harvest losses.

CHAPTER ONE: INTRODUCTION

This chapter includes a short overview of the research study. It encompasses the study background, problem statement, research objectives, significance, justification, and scope of the study.

1.1 Background to the study

Maize (Zea mays ssp), a member of the tribe Maydeae in the family Poaceae, is one of the world's top cereal grains alongside rice and wheat. Originating in Mexico and Central America around 1,000 years ago, maize has over 32,000 genes, enabling it to thrive in diverse environments—a trait unmatched by any other crop (Openjuru & Ph, 2019). Maize is a crucial food, feed, and industrial crop globally and plays a key role in food security(*Maize Global Nutrition,*.). Cereal crops significantly impact the livelihoods of smallholder farmers in sub-Saharan Africa (SSA) heavily rely on maize, the main food and cash crop for millions of rural households. Maize kernels are versatile, consumed directly from the cob or prepared by parching, boiling, frying, roasting, grinding, or fermenting, making them useful in breads, porridges, gruels, cakes, and alcoholic drinks . (Chune, 2022) (Chune, 2022). Maize provides about 15% of the world's protein and 20% of its calories, serving as a staple for over 200 million people—a figure expected to rise as the global population approaches 8 billion. This underscores maize's crucial role in global nutrition.

Maize was introduced to Uganda in 1861 and has since become an integral part of the country's farming system, ranking as the third most important cereal crop after finger millet and sorghum. A significant portion of maize production in Uganda is intended for export to neighbouring markets, such as Kenya and, more recently, South Sudan, where demand is high. Quality specifications for maize are applied to ensure it meets international market standards. The maize sector supports the livelihoods of approximately 3 million Ugandan households, making it an increasingly important income source and a significant contributor to foreign earnings through exports. The Ugandan government encourages smallholder farmers to grow maize due to its dual role in enhancing food security and generating income. Many Ugandans rely on maize as a staple food alongside other crops like cassava, sweet potatoes, beans, and matooke. As a key staple, maize is cultivated in nearly all regions of Uganda and is grown by over 55% of households.

REFERENCE

Afriyie, E., Gatzweiler, F., Zurek, M., Asem, F. E., Ahiakpa, J. K., Okpattah, B., Aidoo, E. K., & Zhu, Y. G. (2022). Determinants of Household-Level Food Storage Practices and Outcomes on Food Safety and Security in Accra, Ghana. *Foods*, *11*(20). https://doi.org/10.3390/foods11203266

Agricultural Extension and Technology Adoption for Food Security: Evidence from Uganda | IZA - Institute of Labor Economics..). https://www.iza.org/publications/dp/9206/agricultural-extension-and-technology-adoption-for-food-security-evidence-from-uganda

Ainembabazi, J. H., & Mugisha, J. (2014). The Role of Farming Experience on the Adoption of Agricultural Technologies: Evidence from Smallholder Farmers in Uganda. In *Journal of Development Studies* (Vol. 50, Issue 5, pp. 666–679). https://doi.org/10.1080/00220388.2013.874556

Chete, O. B. (2019). Gender and Agricultural Practice in Developing Countries: Literature Review. In *South Asian Journal of Social Studies and Economics* (pp. 1–11). https://doi.org/10.9734/sajsse/2019/v5i230142

Chune, M. D. (2022). Determinants of Maize Production Income in Western Uganda. *East African Journal of Agriculture and Biotechnology*, *5*(1), 1–13. https://doi.org/10.37284/eajab.5.1.532

Djoumessi, Y. F. (2021). What innovations impact agricultural productivity in Sub-Saharan Africa? In *Journal of Agriculture and Food Research* (Vol. 6). https://doi.org/10.1016/j.jafr.2021.100228

Esabu, A., & Ngwenya, H. (2019). Socio-Economic Factors Influencing Adoption of Conservation Agriculture in Moroto District, Uganda. In *South African Journal of Agricultural Extension* (Vol. 47, Issue 2, pp. 105–117). https://doi.org/10.17159/2413-3221/2019/v47n2a507

Gopala Swamy, S. V. S., & John Wesley, B. (2020). Traditional knowledge of post-harvest crop handling by tribal farmers of Northern Andhra Pradesh. *Indian Journal of Ecology*, *47*(2).

Leliveld, A., Dietz, T., Foeken, D., & Klaver, W. (2013). Agricultural dynamics and food

security trends in Uganda Research Report 2013-ASC-2. *Developmental Regimes in Africa (DRA) Project; ASC-AFCA Collaborative Research Group: Agro-Food Clusters in Africa (AFCA), London/Leiden, December*.

Manandhar, A., Milindi, P., & Shah, A. (2018). An overview of the post-harvest grain storage practices of smallholder farmers in developing countries. *Agriculture (Switzerland)*, *8*(4), 13–20. https://doi.org/10.3390/agriculture8040057

Midamba, D. C., & Kizito, O. (2022). Determinants of access to trainings on post–harvest loss management among maize farmers in Uganda: a binary logistic regression approach. *Cogent Economics and Finance*, *10*(1). https://doi.org/10.1080/23322039.2022.2148359

Mishra, K., Sam, A. G., Miranda, M. J., & Diiro, G. M. (2015). Gender and Dynamics of Technology Adoption : Evidence From Uganda. In *2015 Agricultural & Applied Economics Association and Western Agricultural Economics Association Annual Meeting* (p. 6).

Mukasa, A. N. (2018). Technology adoption and risk exposure among smallholder farmers: Panel data evidence from Tanzania and Uganda. In *World Development* (Vol. 105, pp. 299–309). https://doi.org/10.1016/j.worlddev.2017.12.006

Mwaura, F. (2014). Effect of Farmer Group Membership on Agricultural Technology Adoption and Crop Productivity in Uganda. In *African Crop Science Journal* (Vol. 22, Issue s4, pp. 917–927).

Openjuru, G. L., & Ph, D. (2019). *Makerere university makerere university*. *June*, 540009.

Owach, C., Bahiigwa, G., & Elepu, G. (2017). Factors Influencing the Use of Food Storage Structures by Agrarian Communities in Northern Uganda. *Journal of Agriculture, Food Systems, and Community Development*, 1–18. https://doi.org/10.5304/jafscd.2017.072.003

Shibata, R. (2019). *Understanding the dynamics and diversity of smallholder farmers ' innovation processes and agricultural innovation systems in Uganda* (Issue September).

Smale, M., Byerlee, D., & Jayne, T. S. (n.d.). *MAIZE REVOLUTIONS IN SUB-SAHARAN AFRICA*. http://www.tegemeo.org

Stewart, R., Langer, L., Da Silva, N. R., Muchiri, E., Zaranyika, H., Erasmus, Y., Randall, N., Rafferty, S., Korth, M., Madinga, N., & de Wet, T. (2015). The Effects of Training,

Innovation and New Technology on African Smallholder Farmers' Economic Outcomes and Food Security: A Systematic Review. In *Campbell Systematic Reviews* (Vol. 11, Issue 1, pp. 1–224). https://doi.org/10.4073/csr.2015.16

Swai, J., Mbega, E. R., Mushongi, A., & Ndakidemi, P. A. (2019). Post-harvest losses in maize store-time and marketing model perspectives in Sub-Saharan Africa. *Journal of Stored Products and Postharvest Research*, *10*(1), 1–12. https://doi.org/10.5897/JSPPR2018.0270

Afriyie, E., Gatzweiler, F., Zurek, M., Asem, F. E., Ahiakpa, J. K., Okpattah, B., Aidoo, E. K., & Zhu, Y. G. (2022). Determinants of Household-Level Food Storage Practices and Outcomes on Food Safety and Security in Accra, Ghana. *Foods*, *11*(20). https://doi.org/10.3390/foods11203266

Agricultural Extension and Technology Adoption for Food Security: Evidence from Uganda | IZA - Institute of Labor Economics..). https://www.iza.org/publications/dp/9206/agricultural-extension-and-technology-adoption-for-food-security-evidence-from-uganda

Ainembabazi, J. H., & Mugisha, J. (2014). The Role of Farming Experience on the Adoption of Agricultural Technologies: Evidence from Smallholder Farmers in Uganda. In *Journal of Development Studies* (Vol. 50, Issue 5, pp. 666–679). https://doi.org/10.1080/00220388.2013.874556

Chete, O. B. (2019). Gender and Agricultural Practice in Developing Countries: Literature Review. In *South Asian Journal of Social Studies and Economics* (pp. 1–11). https://doi.org/10.9734/sajsse/2019/v5i230142

Chune, M. D. (2022). Determinants of Maize Production Income in Western Uganda. *East African Journal of Agriculture and Biotechnology*, *5*(1), 1–13. https://doi.org/10.37284/eajab.5.1.532

Djoumessi, Y. F. (2021). What innovations impact agricultural productivity in Sub-Saharan Africa? In *Journal of Agriculture and Food Research* (Vol. 6). https://doi.org/10.1016/j.jafr.2021.100228

Esabu, A., & Ngwenya, H. (2019). Socio-Economic Factors Influencing Adoption of Conservation Agriculture in Moroto District, Uganda. In *South African Journal of*

Agricultural Extension (Vol. 47, Issue 2, pp. 105–117). https://doi.org/10.17159/2413-3221/2019/v47n2a507

Gopala Swamy, S. V. S., & John Wesley, B. (2020). Traditional knowledge of post-harvest crop handling by tribal farmers of Northern Andhra Pradesh. *Indian Journal of Ecology*, *47*(2).

Leliveld, A., Dietz, T., Foeken, D., & Klaver, W. (2013). Agricultural dynamics and food security trends in Uganda Research Report 2013-ASC-2. *Developmental Regimes in Africa (DRA) Project; ASC-AFCA Collaborative Research Group: Agro-Food Clusters in Africa (AFCA), London/Leiden, December*.

Manandhar, A., Milindi, P., & Shah, A. (2018). An overview of the post-harvest grain storage practices of smallholder farmers in developing countries. *Agriculture (Switzerland)*, *8*(4), 13–20. https://doi.org/10.3390/agriculture8040057

Midamba, D. C., & Kizito, O. (2022). Determinants of access to trainings on post–harvest loss management among maize farmers in Uganda: a binary logistic regression approach. *Cogent Economics and Finance*, *10*(1). https://doi.org/10.1080/23322039.2022.2148359

Mishra, K., Sam, A. G., Miranda, M. J., & Diiro, G. M. (2015). Gender and Dynamics of Technology Adoption : Evidence From Uganda. In *2015 Agricultural & Applied Economics Association and Western Agricultural Economics Association Annual Meeting* (p. 6).

Mukasa, A. N. (2018). Technology adoption and risk exposure among smallholder farmers: Panel data evidence from Tanzania and Uganda. In *World Development* (Vol. 105, pp. 299–309). https://doi.org/10.1016/j.worlddev.2017.12.006

Mwaura, F. (2014). Effect of Farmer Group Membership on Agricultural Technology Adoption and Crop Productivity in Uganda. In *African Crop Science Journal* (Vol. 22, Issue s4, pp. 917–927).

Openjuru, G. L., & Ph, D. (2019). *Makerere university makerere university*. *June*, 540009.

Owach, C., Bahiigwa, G., & Elepu, G. (2017). Factors Influencing the Use of Food Storage Structures by Agrarian Communities in Northern Uganda. *Journal of Agriculture, Food Systems, and Community Development*, 1–18. https://doi.org/10.5304/jafscd.2017.072.003

Shibata, R. (2019). *Understanding the dynamics and diversity of smallholder farmers ' innovation processes and agricultural innovation systems in Uganda* (Issue September).

Smale, M., Byerlee, D., & Jayne, T. S. (n.d.). *MAIZE REVOLUTIONS IN SUB-SAHARAN AFRICA*. http://www.tegemeo.org

Stewart, R., Langer, L., Da Silva, N. R., Muchiri, E., Zaranyika, H., Erasmus, Y., Randall, N., Rafferty, S., Korth, M., Madinga, N., & de Wet, T. (2015). The Effects of Training, Innovation and New Technology on African Smallholder Farmers' Economic Outcomes and Food Security: A Systematic Review. In *Campbell Systematic Reviews* (Vol. 11, Issue 1, pp. 1–224). https://doi.org/10.4073/csr.2015.16

Swai, J., Mbega, E. R., Mushongi, A., & Ndakidemi, P. A. (2019). Post-harvest losses in maize store-time and marketing model perspectives in Sub-Saharan Africa. *Journal of Stored Products and Postharvest Research*, *10*(1), 1–12. https://doi.org/10.5897/JSPPR2018.0270