

**ASSESSING THE FACTORS RESPONSIBLE FOR POST-HARVEST LOSSES ON
SORGHUM DURING STORAGE**

CASE STUDY: LOTOME SUB COUNTY, NAPAK DISTRICT

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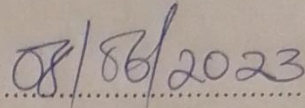
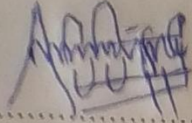
**A DISSERTATION SUBMITTED TO THE FACULTY OF AGRICULTURE AND
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DECLARATION

I, **LORU SIMON PETER**, declare that this is my original work and has never been presented for a degree award in any University or any other institution of higher learning.



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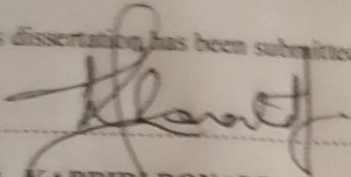
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APPROVAL

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DEDICATION

I dedicate this dissertation to my Sponsor my FORBERG and FAWE-UG for the continues support throughout the entire research process.

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ABBREVIATIONS AND ACRONYMS

FAO	Food and Agriculture Organization of the United Nations
UBOS	Uganda Bureau of Statistics
N	Northings
E	Eastings
PICS	Purdue Improved Cowpea Storage
ZECC	Zero Energy Cool Chamber
PHL	Post-Harvest Loss
SPSS	Statistical Package for Social Scientists

ABSTRACT

Sorghum is an important staple crop in Uganda serving as a daily food requirement. Besides international aims for the reduction of post-harvest losses, some farmers in developing countries are still faced with significant losses. The losses resulting from post-harvest storage are among the key constraints to improving food and nutritional security in Africa including Uganda. Despite the importance of grain storage for food security, the factors responsible for post-harvest losses on sorghum during storage have not been well investigated to develop effective strategies and interventions for improving sorghum post-harvest storage practices. The overall objective of the study is to assess the factors responsible for post-harvest losses on sorghum during storage. The specific objectives of the study were to; (i) assess the factors responsible for post-harvest losses on sorghum during storage, (ii) identify modes of storage used by sorghum farmers, and state possible strategies that can reduce post-harvest losses on sorghum during storage. The study adopted a cross-sectional study with both quantitative and qualitative data collection approaches. Data was collected from 100 sorghum farmers in Lotome sub-county in Napak district. The modes of storing sorghum were storage bags, granaries, cribs, and silos. This was stored in the form of un-milled, polished, and dried. However, these storage modes are challenging. The factors responsible for post-harvest losses on sorghum during storage included fire outbreaks, insect and rodent infestation, theft, rotting and moulding, poor storage facility and bags, partial drying, mixing new and old, heavy rainfall, and harvesting immature crops. Lastly, several strategies that can be implemented to reduce the post-harvest losses on sorghum during storage. These are the provision of community security, provision of a modern storage facility, provision of good quality seeds, proper sun drying, harvesting mature crops, creating a ready market, training farmers, provision of pesticides and insecticides, extending extension services to farmers, and access to loans. The study recommends establishing capacity-building programmes for extension officers so that they can train sorghum farmers on better post-harvesting technologies.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Sorghum (*Sorghum bicolor*) is a staple cereal crop of major nutritional and economic importance in the world today (Cardoso et al., 2017; Proietti et al., 2015). Due to its highest agronomic, nutritional, and economic value with no exception of drought and heat tolerance, Sorghum is the fifth most grown and produced cereal (McRae, 2017). Globally, Sorghum production stands at 58 million tonnes. However, this varies within the global regions as countries (FAOSTAT, 2022). Regionally, Africa is the leading sorghum producer at 27 million tonnes, America with 20 million tonnes, Asia with 9m tonnes, Europe with 1 million tonnes, and Oceania with 0.4 tonnes (FAOSTAT, 2022). Sorghum according to Uganda, is the third most important cereal crop after maize and rice. The sorghum production stands at 0.2 tonnes (FAOSTAT, 2022) The crop is largely grown in the Northern and Eastern regions of Uganda.

However, it is the third food crop produced with no exception lost globally during post-harvest operations every year (Manandhar et al., 2018). This loss occurs at different stages such as there is post-harvest quantitative loss of up to 15% in the field, 13–20% during processing, and 15–25% during storage have been estimated (Abass et al., 2014). Consequently, the loss of sorghum grains during post-harvest storage will exacerbate the current acute malnutritional and hunger rates for households. The loss has been attributed to multiple factors among which include financial, managerial, and technical limitations in harvesting, storage, and preservation techniques challenges (Food and Agriculture Organization of the United Nations (FAO), 2011).

As shown above, there is a need to improve the existing post-harvest sorghum storage practices for the farmers. This is certainly true as improvement in agricultural practices for smallholder farmers is essential to achieve an efficient grain supply chain with increased grain yields, reduced grain losses during storage and handling, and reduced time and effort to accomplish harvest and post-harvest operations. Loss during grain storage is one of the main contributors to total post-harvest grain losses (Kumar & Kalita, 2017). Effective grain storage with minimal grain losses could significantly contribute toward reducing overall food losses for smallholder farmers and have an immediate and significant impact on their livelihoods. This study,

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