

# ASSESSING THE FACTORS AFFECTING SORGHUM PRODUCTION AMONG SMALL-SCALE FARMERS IN ABIM SUB-COUNTY, ABIM DISTRICT.

BY

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A RESEARCH DISSERTATION SUBMITTED TO THE DEPARTMENT OF

AGRIBUSINESS AND EXTENSION AS PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE AWARD OF A BACHELOR'S DEGREE IN AGRIBUSINESS

MAY, 2023

DECLARATION Ongom Denis, hereby declare that this is my or	riginal work and where other acceles			
I,Ongom Denis,hereby declare that this is my original work ,and where other people's work were been used, it was duly acknowledged. I further declare that this work has not been				
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### APPROVAL

This is to clarify that this research dissertation titled "Assessing the factors affecting sorghum production among small scale farmers in Abim sub - county, Abim district was done under the supervision of

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### **DEDICATION**

This report is dedicated to my dear brother Mr; OKIDI BOB, who has been a constant source of support and encouragement; during the challenges of graduate school and life. I am truly thankful for having you in my life. This report is also dedicated to the memory of my grand parents; PAPA AWANY JACKSON JEREMIAH and MAMA AWILLI JERAH, although they were my inspiration to pursue my education, they are unable to see my graduation

#### ACKNOWLEDGEMENT

Above all, I wish to thank Lord God almighty who has continued to keep me safe and gave me knowledge to accomplish this work.

I wish to extend my sincere gratitude to my supervisors, Dr.KABBIRI RONALD and Mr.OYOM GEOFFREY for their insight, encouragement and general sense of direction they provided me to enable me complete this work. All Busitema University lecturers who contributed to my wide knowledge in classwork and research also deserve mention.

I would like to extend my sincere appreciation to my dear family members, relatives and friends for their unending love, care and support they always gave me.

My colleagues at Busitema University Arapai Campus especially my course mates and buddies are also recognized for their support, discussions and encouragement in the course of the study.

Thank you very much. May the lord God almighty bless you all!

## TABLE OF CONTENT

DEDICATIONiv
ACKNOWLEDGEMENTv
TABLE OF CONTENTvi
LIST OF TABLESix
LIST OF FIGURESx
LIST OF ACROYMNSxi
ABSTRACTxii
1.0 Chapter one ; Introduction
1.1 Background
1.2 problem statement
1.3 Main objectives
1.4 Specific objectives
1.5 Research questions
1.6 Justification of the study
1.7 Significance of the study
1.8 Scope of the study
1.8.1 Geographical scope
1.8.2 Content scope
1.8.3 Population scope5
2.0 CHAPTER TWO ; LITERATURE REVIEW6
2.2 Historical background of sorghum
2.3 Global trends of sorghum production
2.4 Sorghum production in uganda
2.6 Characteristis of small scale farmers
2.7 Importance of sorghum production
2.8 factors affecting sorghum prodction
2.9 Strategies that can be used to increased the productivity of sorghum
CHAPTER THREE; RSEARCH METHODOLOGY
3.1 Introduction

	3.2 Research design	12
	3.3 Description of the study area	12
	3.4 Study population	12
	3.5 field management and procedure	12
	3.6 sampling procedure	13
	3.7 primary data sources and data collection	13
	3.8The questionnaire survey	14
	3.9 Direct interviews	14
	3.10 Direct observation	14
	3.11 Data analysis	14
	3.12 Data presentation	14
	3.13 Limitations of the study	14
C.	HAPTER 4: RESULTS AND DISCUSIONS	15
	4.0 Introduction	15
	4.1 Demographic characteristics about the respondents	15
	4.1.2 Gender of respondents	17
	4.1.3 Age of the respondents	17
	4.1.4 Education level	17
	4.1.5 Marital status of respondents	18
	4.1.6 Income level of the respondents	18
	4.1.7 main sources of income of the respondents	18
	4.2 Characterization of small scale sorghum farmers in Abim Sub -county, Abim district	18
	4.2.1 Average land used to farm on all crops	18
	4.2.2 Land ownership	19
4.	2.3 Average areas of land allocated for sorghum production	20
	4.2.4 Time spent in growing sorghum	21
	4.2.5 Varieties of sorghum grown by small scale farmers in Abim sub – county	21
	4.2.6 Average numbers of bags of sorghum harvested from one acre of land	22
	4.2.7 Price charged by small scale sorghum on sorghum	23
	4.2.8 places where small scale farmers sold their sorghum	23
	4.2.9 Registration of small scale sorghum farmers to any farmer's groups	24
	4.2.10 Small scale sorghum farmers access to credits	24

4.2 .11 Small scale sorghum farmers access sources to credits	24
4.3 production trend of sorghum production in the past six years in Abim sub county, Abim	
district	25
4.3.1 years in which sorghum production was highest	25
4.3.2 years in which sorghum was lowest	26
4.3.3 Quantity harvested when sorghum production was highest in 2020	27
4.3.4 Quantity harvested when sorghum production was lowest in 2021.	28
4.4 Factors affecting sorghum production among small scale farmers in Abimsub county	28
4.4. 1 Limited access to quality seeds	30
4.4.2 Poor land tenure system	30
4.4.3 pests and diseases	31
4.4.4 Limited access to extension service	31
4.4.5 Drought	31
4.4.6.Decreasing soil fertility	32
4.4.7 Problem of weed infestation	32
CHAPTER FIVE ; DISCUSSIONS OF FINDINGS	32
5.0 Introduction	32
5.1 DISCUSSION OF FINDINGS	32
5.1.2 Demographics characteristics of respondents	33
5.1.3 Characterization of small scale sorghum farmers included the following	33
5.1.4 Production trend of sorghum in the last six years in Abim sub county	34
5.1.5 Factors affecting sorghum production among small scale farmers in Abim sub county.	35
5.2 CONCLUSIONS AND RECOMMENDATIONS	36
5.2. CONCLUSIONS	36
5.3 RECOMMENDATIONS	37
5.4 Suggestions for further research	37
REFERENCES	38
Appendix ;1 showing questionaire used during the study	42

## LIST OF TABLES

Table 1: Showing Sorghum varieties grown in Uganda	7
Table 2: Below showing respondents' socio-economic characteristics	15
Table 3: Shows acres of land used for sorghum production	20
Table 4: Shows varieties of sorghum grown	21
Table 5:Shows numbers of bags got from one acre of land	22
Table 6: Shows prices of sorghum per kg	23
Table 7: Shows places where sorghum are sold by small scale farmers	23
Table 8:Shows whether scale sorghum farmers are registered to any farmer's groups	24
Table 9: Shows access to credits by small scale sorghum farmers	24
Table 10: Shows sources to credits	24
Table 11: Shows numbers of bags of sorghum harvested when sorghum production was higher	est
in 2020	27
Table 12: Shows quantity of sorghum harvested when production was lowest in 2021	28
Table 13: Shows responses by small scale sorghum farmers on factors that affect sorghum	
producton	28

## LIST OF FIGURES

Figure 1: A bar graph showing acres of land used to farm on all crops	19
Figure 2: A bar graph showing land ownership	20
Figure 3: A bar graph showing years spent in sorghum production	21
Figure 4: Shows years n whch sorghum production was highest	25
Figure 5: Shows years in which sorghum production was lowest in the past six years	26

### LIST OF ACROYMNS

FAO Food and Agricultural Organization

AHO Assistant Animal Husbandry Officer

CFSAM Food Assessment For sudan

MOANR Ministry of Agriculture and National Resource

NaSARI National Semi arid Resource Research Institute.

SPSS Statiscal Package for Social Scientists.

SSA Sub Saharan Africa

USA United State of America

Kg Killograms

#### **ABSTRACT**

This research study was about assessing the factors affecting sorghum production among small scale farmers in Abim Sub -county, Abim district. The small scale farmers in Abim district have been cultivating sorghum over years for household consumption and some for sale. The production of sorghum had lower yields in the recent years within the study area. Sorghum is regarded as a food security cereal crop and its ability to withstand dry weather conditions. The objectives of this study was to get about the factors affecting sorghum production among small scale farmers in Abim sub county and give recommendation to boost sorghum's production. To answer this, the following research questions were formulated. How can small scale sorghum's farmers in Abim sub county be characterized? What has been the trend of sorghum production among small scale farmers in Abim sub county? What are the factors affecting sorghum production among small scale farmers in Abim sub county? Furthermore, a qualitative cross sectional survey designed was used to gather data from the 73 respondents. The sampling technique used was simple random sampling where 73 respondents were selected to participate in the study within the six parishes in Abim subcounty. The respondents were given well prepared questionaires, data was analyzed using Microsoft excel and Statistical package for social scientists (SPSS version 20.0), presentation of results were done on line graphs, tables, bar graphs. According to the findings, it was revealed that majority of the respondents with 68.5% were not registered to any farmer's groups whereas respondents with 31.5% were registered to farmer's groups, it was also established that most of the respondents with 53.4% were identified growing local varieties while respondents with 2.7% were identified growing improved varieties such as SES03. In addition, the results also indicated that respondents with 60.3% had no access to credits while respondents with 39.7% had access to credit.In addition, the findings also revealed that the main production constraints which have lowered sorghum's yield in Abim sub- county. These production constraints included limited access to good quality seeds where out of the 73 respondents interviewed, 63.0% strongly agreed with the statement while respondents with 15.1% strongly disagreed with the statement .Conclusively, the study also gave some recommendation such as; there should be extension of agro inputs stores to rural places so that farmers can have easy access to good quality seeds.

### 1.0 Chapter one; Introduction

### 1.1 Background

Sorghum originated in Eastern Africa, in the region bordering Sudan and Ethiopia (Winchell et al., 2018). It is the fifth most important world cereal crop after maize, wheat, rice and barley, the crop is the staple food in the drier parts of Africa, China and India (Rao et al., 2013). The largest world's sorghum producers are USA, Nigeria, Ethiopia and Sudan (Rapsomanikis, 2015).

In Sub saharan Africa, Nigeria is the leading producer of sorghum followed by Ethiopia in term of total production (Wanga et al., 2022). The crop has also been reported to be African's second most important cereal crop after maize. On the other hand, it is also ranked as the third cereal crop in East Africa after maize and millet (N. Mary A. Mgonja, Ivan Rwomushana, Fina Opio, 2006). Furthermore, sorghum is also a member of the grass family graminea. (Willetts et al., 2016). It also act as an important staple food in East Africa which leds to contribution to national food supply in Sudan, Somalia, south Sudan, Ethiopia and Uganda (FEWSNET, 2022).

In Uganda, sorghum has become the second most important cereal crop grown after maize in terms of production and it is mostly produced in the northern parts followed by eastern, southwestern regions and finally central (Lubadde et al., 2019). Occasionally, sorghum grain is fermented for malting and is used in preparing local brewing products. Industrially, it is predominantly used by companies producing beverages, and small percentages of grain is also used as animal feeds (Ratnavathi& Chavan, 2016). Inspite of all those importance of sorghum, it has been reported that the production trend of sorghum is still worrying due to both biotic and abiotic constraints including poor soil fertility, water scarcity, crop pests and diseases, weeds and poor agronomic practices hence have lead to decline of sorghum yields (Nyawaro, 2018). In addition, there are also some strategies which have been put in place to improve on the productivity of sorghum like pest and diseases management, introduction of good quality seeds and used of machines such as tractors (Winchell et al., 2017).

In Karamoja sub region, sorghum occupied 77% of the total area of under production where it is grown in all districts such as Amudat with 97%, Abim with 84%, Kaabong with 93%, Moroto with 78%, and Nakapiripirit with 79% (food Security assessment, 2018). Furthermore, the crop is also used for both domestic food and commercial purposes while others processed sorghum

### **REFERENCES**

- .C, E., & Henley. (2010). Sorghum: An Ancient, Healthy and Nutritious Old World Cereal Sorghum: An Ancient, Healthy and Nutritious Old World Cereal Table of Contents. 33.
- Aissata MI. (2018). Characteristization of Sorghum Production Constraints and Ideal Plant and Variety Traits as Perceived by Farmers in Niger. *JSM Biotechnol Bioeng*, *5*(1), 1084.
- https://www.jscimedcentral.com/Biotechnology/biotechnology-5-1084.pdf
- Ari Akin, P., Demirkesen, I., Bean, S. R., Aramouni, F., & Boyaci, I. H. (2022). Sorghum Flour Application in Bread: Technological Challenges and Opportunities. *Foods*, *11*(16), 1–28. https://doi.org/10.3390/foods11162466
- Awori, E., Kiryowa, M., Basirika, A., Dradiku, F., Kahunza, R., Oriba, A., Edonia, C., Olupot, R., & Mukalazi, J. (2016). Performance of elite grain sorghum varieties in the West Nile Agroecological Zones. *Uganda Journal of Agricultural Sciences*, 16(1), 139.

- https://doi.org/10.4314/ujas.v16i1.12
- Bruggers, R. L., & Jaeger, M. M. (1982). Bird Pests and Crop Protection Strategies for Cereals of the Semi-Arid African Tropics. *Sorghum in the Eighties: Proceedings of the International Symposium on Sorghum*, 2–7.
- Current, C., & Security, F. (2018). S Cenario S Ummary T Able for Outcome Analysis Step 1 Set Parameters. 1–21.
- Edition, S., & No, R. (2014). AFRICAN CD-ARS. 2014.
- FEWSNET. (2022). REGIONAL SUPPLY AND MARKET OUTLOOK: East Africa: Maize. 1–12.
- FiBL: African Agriculture Training Manual. (2012). 9-4 Sorghum. Version 2.0 July 2012, July, 21.
- Gourichon H. (2013). Analysis of incentives and disincentives for sorghum in Nigeria. Technical notes series, MAFAP, FAO,Rome. *Monitoring African Food and Agricultural Policies Project (MAFAP)*, February, 23–30.
- Gwata Gwata, E. T. E. T., Silim, S. N. S. N. S., & Mgonja Mgonja, M. M. (2006). *International Crops Research Institute for the Semi-Arid Tropics*. http://www.cabicompendium.org
- Kimbi, T. G., Akpo, E., Kongola, E., Ojiewo, C. O., Vernooy, R., Muricho, G., Ringo, J., Lukurugu, G. A., Varshney, R., & Tabo, R. (2020). A probit Analysis of Determinants of Adoption of Improved Sorghum Technologies Among Farmers in Tanzania. *Journal of Agricultural Science*, 13(1), 73. https://doi.org/10.5539/jas.v13n1p73
- Lubadde, G., Ebiyau, J., Aru, J. C., Andiku, C., Wandulu, J. A., & Ugen, M. A. (2019). Sorghum production handbook for Uganda. *National Semi Arid Resources Research Institute of the National Agricultural Research Organisation (NaSARRI-NARO), Uganda.*, 37.
- Mwenda, E. T., Ringo, J. H., & Mbega, E. R. (2019). Sorghum chemistry delineates levels of its susceptibility to weevils (Sitophilus spp) and breeding strategies towards variety development; a review. *Journal of Animal and Plant Sciences*, 29(5), 1213–1227.
- N. Mary A. Mgonja, Ivan Rwomushana, Fina Opio, M. B. (2006). Integrated sorghum and millet sector for improved livelihoods in ECA. In *Proceedings of the ECA Regional Sorghum and Millet Network Stakeholders*.

- Njagi, T., Onyango, K., Kirimi, L., & Makau, J. (2019). Sorghum Production in Kenya: Farm-level Characteristics, Constraints and Opportunities. *Tegemeo Institute of Agricultural Policy and Development, Egerton University, March*, 43.
- Obaa, B., Angudubo, S., & Studies, I. (2020). Engendered Value Chain Assessment for Sorghum, Groundnuts, Milk and Gum Arabic in the Former Northern Bahr El Ghazal State, March.
- Prospects, C., & Situation, F. (2022). Crop Prospects and Food Situation #3, September 2022. In *Crop Prospects and Food Situation #3, September 2022* (Issue September). https://doi.org/10.4060/cc2300en
- Rao et al., 2013. (2013). Sorghum production for food security. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). \*Corresponding author: h.upadhyaya@cgiar.org, 27.
- Rapsomanikis, G. (2015). Food and Agriculture Organization of the United Nations Rome. www.fao.org/publications
- Ratnavathi, C. V., & Chavan, U. D. (2016). Malting and Brewing of Sorghum. *Sorghum Biochemistry: An Industrial Perspective*, 63–105. https://doi.org/10.1016/B978-0-12-803157-5.00002-2
- S., W., Martha, M., Christopher, M., Elias, L., Girma, A., Kaizzi, K. C., Medson, C., Munyaradzi, M., Soares, X., & Theophile, N. (2009). Atlas of Sorghum Production in EAst and Southern Africa. 1–63.
- Sulistyowati, D. D. (2021). Water Stress and Water Requirement of Sorghum: Case Study of Dry Areas in East Nusa Tenggara. May.
- Taylor, J. (2004). Overview: Importance of sorghum in Africa. Department of Food Science.
- Tenywa, M. M., Nyamwaro, S. O., Kalibwani, R., Mogabo, J., Buruchara, R., & Oluwole, F. (2018). Innovation Opportunities in Sorghum Production in Uganda. *FARA Research Report*, 2(18), 1–20. www.faraafrica.org
- Tonitto, C., & Ricker-Gilbert, J. E. (2016). Nutrient management in African sorghum cropping systems: applying meta-analysis to assess yield and profitability. *Agronomy for Sustainable*

- Development, 36(1), 1–19. https://doi.org/10.1007/s13593-015-0336-8
- Tusiime, H., Twanza, E., Ogenrwoth, A., Gule, S., Odong, J., Ndawula, J., Egabu, J., Namurebire, P., & Lokiru, M. (2013). *Karamoja Rapid Crop and Food Security Assessment. August*.
- UN. (1959). World Economic Survey 1958 United Nations. 1–315.
- Upadhyay, P. (2019). Climate change and adaptation strategies: a study of agriculture and livelihood adaptation by farmers in Bardiya District, Nepal. *Advances in Agriculture and Environmental Science: Open Access (AAEOA)*, 2(1), 47–52. https://doi.org/10.30881/aaeoa.00022
- USAID. (2013). Livelihood Dynamics in Northern Karamoja. A participatory Baseline Study for the growth Health and Governance Program. *Agriculture*, *May*, 1–64. https://fic.tufts.edu/publication-item/livelihood-dynamics-in-northern-karamoja/%0D%0A
- Wanga, M. A., Shimelis, H., & Mengistu, G. (2022). Sorghum Production in Northern Namibia: Farmers' Perceived Constraints and Trait Preferences. *Sustainability (Switzerland)*, *14*(16), 1–16. https://doi.org/10.3390/su141610266
- Willetts, A. H. J., Wong, J. A., & Kirst, G. D. (2016). Published by: Springer on behalf of New York Botanical Garden Press Stable URL: http://www.jstor.org/stable/4353966.46(2), 101–165.
- Winchell, F., Brass, M., Manzo, A., Beldados, A., Perna, V., Murphy, C., Stevens, C., & Fuller,
  D. Q. (2018). On the Origins and Dissemination of Domesticated Sorghum and Pearl Millet across Africa and into India: a View from the Butana Group of the Far Eastern Sahel. *African Archaeological Review*, 35(4), 483–505. https://doi.org/10.1007/s10437-018-9314-2
- Winchell, F., Stevens, C., Murphy, C., Champion, L., & Fuller, D. (2017). Evidence for Sorghum
- Domestication in Fourth Millennium BC Eastern Sudan: Spikelet Morphology from Ceramic Impressions of the Butana Group. *Current Anthropology*, 58, 0. https://doi.org/10.1086/693898
- Yarnell, A. (2008). Feeding Africa. Chemical and Engineering News, 86(4), 74.