ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

Sesame Value Chain Analysis: Enabling Environment Impact on Smallholders in Magwi County, South Sudan

Johnny Dennis Okeny[1]; Salah Jubarah[2]; Tony Ngalamu[3]

[1]PhD Candidate, Department of Agricultural Sciences, School of Natural Resources and Environmental Studies, University of Juba, Juba, South Sudan
[2]Professor, Dean School of Natural Resources and Environmental Studies, University of Juba, Juba, South Sudan
[3]Associate Professor, Department of Agricultural Sciences, School of Natural Resources and Environmental Studies, University of Juba, Juba, South Sudan

Publication Date: 2026/01/10

Abstract: The study identified the impacts of the enabling environment on sesame production and marketing, and suggested option to remove constraints. The study sampled 490 households from 6 localities in Magwi and Pajok Payams of Magwi County, South Sudan. Simple descriptive statistical techniques like frequency, percentages and mean were administered for households' quantitative data analysis using the latest version of SPSS. The result of the study revealed that the majority (90.20%) household heads fall in the age range 18-54 years, considered active in farming. Some of the government policies and regulations that are obstacles to smallholder's sesame production and marketing include high/excessive taxation rates, market fees and charges; poor quality of market infrastructure and facilities; lack of national market information system; lack of/inadequate off-farm storage; road blocks/ police check points; import/export taxes; and limited public investment in roads infrastructure (trunk roads, rural/feeder roads). Conversely, there was inadequate access to vital production and marketing infrastructure and social services like microfinance institution, banking facility, ox-ploughing infrastructure, and market structures. The study identified gaps in the services of agro-dealers in the study areas.73.5% of smallholders did not have access to extension services, 40.7% did not have access to market information while (86.2%) have no access to loans. The study suggested strategies and policy options to remove constraints in the enabling environment including reviewing laws, policies, rules and regulation; improving public infrastructure and facilities; and strengthening business supporting services delivery for production and marketing of sesame.

Keywords: *Business Supporting Services;Enabling Environment; Sesame; Value Chain.*

How to Cite: Johnny Dennis Okeny; Salah Jubarah; Tony Ngalamu (2026) Sesame Value Chain Analysis: Enabling Environment Impact on Smallholders in Magwi County, South Sudan. *International Journal of Innovative Science and Research Technology*, 11(1), 390-401. https://doi.org/10.38124/ijisrt/26jan261

I. INTRODUCTION

Oil production plays an important role in the country's economy, contributing to about 60 percent of the GDP, 95 percent of exports, 90 percent of government revenues and a significant share of private sector employment (FAO, 2022). On the other hand, the agriculture sector in South Sudan accounts for 15 percent of GDP and employs 80 percent of the population (UNDP, 2023). However, the majority of farmers cultivate small areas, average of one to three Feddans of land (0.4 to 1.2 hectares), and farm size has not increased much. The majority of farmers are subsistence farmers, most of whom use own preserved traditional varieties of seeds with very scanty use of chemical fertilizers, pesticides and herbicides and limited use of high yielding crop seeds (JICA, 2015).

Crop production in South Sudan is mainly conducted by smallholder farmers on small plots of land cultivated manually using hand tools. The average family size is five to seven persons that belong to larger family aggregations and the of the cultivated area is limited mainly by (a) the size of the household labour force and/or the ability of the households to provide in-kind payment (essentially food/local beer) for the mobilization of traditional working groups (nafeer); (b) the limited availability of efficient tools and power for land clearing and ploughing; and (c) a volatile security situation constraining access to fields, despite marked improvements in recent year (FAO and WFP, 2025).

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

The goal of the Oilseeds Strategy of South Sudan is to set the sector on a course of strategic development by comprehensively addressing constraints (related to use of poor-quality inputs, production techniques, limited value addition, quality standards and access to market information) and defining concrete opportunities that can be realized through specific activities (such as building the capacities of value chain actors, promoting value addition activities through financial and technical support, developing a trade information network, etc.). The upgrading strategy for the oilseeds sector include providing business development support to firms, enhancing innovation and creating an enabling business environment (International Trade Center,2024).

The market for sesame in South Sudan is quite small domestically. A number of informal village traders collect sesame seeds from farmers, paying them in cash. They then sell the sesame to processors or exporters, or sell them in domestic markets. A number of exporters in South Sudan transport the sesame seeds to regional markets (Summer (2020). Sesame output is generally sold to Sudanese traders, not only due to the high prices they offer but also due to the poor state of the road network linking Upper Nile State with the capital, Juba (FAO ,2023). Small and fragmented nature of landholdings, climate shocks, and insufficient availability of quality inputs, traditional farming methods, and limited processing are major constraints in the sesame value chain (Whitepeak, 2023).

Private sector development also faces many structural constraints: including hyperinflation; poor infrastructure development; lack of proper firm legal base (business registration; agriculture sector policies and regulations; and import/export regulations). Other challenges include limited access to necessary information/data, lack of clear land acquisition processes, limited intellectual property protection, unclear dispute resolution processes, informal taxes and non-transparent taxation regime, informal markets (inputs, outputs and labour) and limited financial services (Eliste *et al.*, 2022). On the other hand, smallholders often find it difficult to exploit the opportunities presented by expanding markets because of their limited access to resources such as land, credit, technical advice, and current information on market prices and conditions (Devaux *et al.*, 2016).

The major constraints in the sesame value chain in South Sudan include climate shocks, insufficient availability of quality inputs, and lack of access to extension services and low yields due traditional farming methods. Likewise, pests and diseases are the major factors hindering agricultural development followed by insecurity, bad roads, flooding, poor rural road network, lack of markets and storage facilities.

Therefore, this study aims to review the impact of the enabling environment constraints on son sesame production and marketing in the study areas and how to alleviate them. in the study areas. The specific objectives of this study are to: i. describe the socioeconomic characteristics of the respondents in the study areas, ii identify the impacts of the enabling environment on sesame production and marketing in the study areas and, iii suggest strategies and policy options to remove constraints in the enabling environment and thus contribute to sustainable sesame production and marketing.

II. METHODOLOGY

- *Study Area*

The study was conducted in Owinykibul locality in Magwi Payam and Pajok Payam in Magwi County, Eastern Equatoria State of South Sudan. Magwi County falls in Longitudes: 31.715° E and 32.887° E, and Latitudes: 3.3.497° N and 4.395°N. Its altitude ranges from 514-2,223m above sea level. The County borders Torit County in the East, and Republic of Uganda in the Southwest. Magwi County has an estimated population of 296,326 persons (National Bureau of Statistics-NBS, 2015) living in an area of 5,202 km² Area. Magwi Payam has a population of 72,823, while Pajok Payam has 37,300 persons.

The study areas in Magwi County lie in the Equatorial Maize and Cassava (SS01) livelihood zone which is one of the 12 livelihood zones of South Sudan The zone has a bi-modal rainfall pattern with two reliable seasons and average annual precipitation of 1100-1600 millimetres (mm); although the seasonal averages range 600-900 mm each season. Rains typically start in March to June with a break in late June then restart in July to November. The temperatures are relatively warm throughout the year, especially in lowlands, and cooler in highlands averaging between 27-30° Celsius in January to February and 30-35° Celsius from December to March (FEWS NET.2018).

The main economic activities consist of rain-fed mixed farming with some animal husbandry and exploitation of forest products. The major crops grown in Juba, Magwi and Yambio Counties include maize, pigeon peas, soybean, beans, cassava, sorghum, sesame, and cassava. The major livestock enterprises include cattle, goats, sheep, chicken, and piggery. Other sources of livelihood in the area are hunting (Yuga ME, Wani J, 2022).

- *Sources and Method of Data Collection*

The survey employed mixed methodology combining qualitative and quantitative methods. On mixed-method design. This survey collected primary quantitative data through household structured questionnaires, in addition to individual survey with markets actors and consumers of sesame products. Whereas, qualitative data were collected through key informant's interviews and focus group discussions. On the other hand, secondary data were collected through literature review of Journals, books, conference papers and other relevant sources.

- *Sampling and Sampling Technique*

The study used multi-stage sampling technique, whereby in the first stage, Magwi and Pajok Payams were purposely selected based on their potentials for sesame production and marketing, Whereas, in the second stage six locations were randomly targeted from each of the two Payams, In the final stage, specified samples of household heads were selected randomly, using probability proportionate to size for Pajok and Magwi Payams respectively. The required sample size determined using Yamane's (1967) formulae, at 95%

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

Confidence Level with +/- 7% level of precision to represent the population. n=N/1+N(e2). Where **n**= is the sample size N=Population in the selected Payam e=level of precision (0.07)

Face to face structured interviews was conducted to collect primary data from 409 households in Magwi (Owinykibul) Payam and Pajok Payam and in addition individual surveys were conducted with agro-input suppliers, collectors/local traders, wholesalers, retailers, processors, consumers and end-users (e.g. restaurant), Simple random sampling techniques was employed to draw sample respondents. Key informant interviews were conducted with the Director for Agriculture and Forestry and Principal Magwi College of Agri-business and Management Sciences College. On the other hand, focus group discussions were held with representatives of local community leaders and farmers' cooperative society members.

➢ *Data Analysis Plan*

The analysis, irrespective of whether the data is qualitative or quantitative, may be to describe and summarize the data, identify relationships between variables, compare variables, identify the difference between variables and forecast outcomes (Dawit DA, 2020). Data from the household interviews were analysed using SPSS and MS Excel. The cleaned quantitative data were subjected to descriptive and inferential analysis. Simple descriptive statistical techniques like frequency, percentages and mean were administered for quantitative data analysis using computer software tools. The latest version of SPSS was used be used for the data analysis. Value chain analysis approach was also used to analyse survey data. Value chain analysis is a process that involved, data collection and research, value chain mapping, analysis of opportunities and constraints, and recommendations for future actions.

III. RESULTS AND DISCUSSIONS

A. Demographic Characteristics of Respondents

The majority (90.20%) household heads fall in the age range 18-54 years, this age group are active and do make significant contribution to sesame production in the study areas. According to Sharon (2016; cited in Rukwe et al., 2020) farmers were between the age brackets of 23-60 years are abler and willing to take risk in expectation of profit than the older ones.

As shown in the Table below of the total sampled 409 households 241 (58.9%) were males, while 168 (41.1%) were females. About 34.2% of households heads were in the 25-34 years' category, 29.4% were 35-44 years old, while 20.7% were in the 45-54 years' age bracket. On the other hand, 8.3% and 5.9% of households heads were of ages 55-64 years and 18-24 years respectively, while, 1.4% were 65 years and above. On marital status, the majority (81.7%) of household heads were married, while 6.1% were separated, 5.9% never married/single respectively, 3.7% were divorced while 2.7% were widowed. Regarding education, about 13.4% of household heads never attended an education programme, 34.4% had some and completed primary education while, 45% did not complete and completed secondary education. On the other hand, only about 2.9% of household heads had some college or university education while, 2.4% of household heads had vocational (Diploma), while 1.7% had vocational (certificate). Overall, 79.4% of household heads in the study areas in Magwi County had some/completed primary and secondary education.

Approximately 53.3% of respondents had household sizes of 4-6 adults (18 years and above), 32.0% mentioned 1-3 members, while 12% had 7-9 members. The mean number of adults (18 years and above) in the household was 4.6 persons. The low mean of 4.6 adult members in the households in the study area could have implication for their access to adequate family labor especially at times when there is peak labor demand for land preparation, weeding and harvesting.

Table 1: Demographic Characteristics of Respondent Across the Study Areas

Variables	**Total**	
	Frequency	**Percentage**
Sex		
Male	241	58.9%
Female	168	41.1%
Age (years)		
18-24 years	24	5.9%
25-34 years	140	34.2%
35-44 years	120	29.4%
45-54 years	85	20.7%
55-64 years	34	8.3%
65 years and above	6	1.4%
Marital status		
Married	344	81.7%
Widowed	11	2.7%
Divorced	15	3.7%
Separated	25	6.1%
Never married/single	24	5.9%
Education		

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

Never attended an education programme	55	13.4%
Some primary education (no completion)	68	16.6%
Primary completed	73	17.8%
Some secondary (no completion)	78	19.1%
Secondary completed	106	25.9%
Vocational (Certificate)	7	1.7%
Vocational (Diploma)	10	2.4%
Some College or University (no completion)	12	2.9%
Household size: number of adults (18 years and above)		
1-3	131	32.0%
4-6	218	53.3%
7-9	49	12.0%
10-12	6	1.5%
More than 13	5	1.2%

Source: Household survey, 2025

B. Enabling Environment Impact on Sesame Production and Marketing

➢ *Laws, Policies, Rules and Regulation*

The major government policies and regulations that are obstacles to smallholder's sesame production and marketing include high/excessive taxation rates (53.4%), market fees and charges (38.7%) and poor quality of market infrastructure and facilities (38.0%). Other challenges included the lack of national market information System (34.8%), lack of/inadequate off-farm storage (34.6%), weak local currency (SSP) against the US$ (34.3%), road blocks/ police check points-illegal taxes (34.1%), import/export taxes (31.1%), high rates of price inflation (32.6%) and limited public investment in roads infrastructure (trunk roads, rural/feeder roads) at 30.1% and regulations related to quality of sesame products (23.8%). Government policies and regulations that are obstacles for the agro-input trading business in the study areas included excessive tax rates, police checkpoints on internal trade, exchange rates management, export/import duties and tariffs (about 6% of the value of sesame seeds) and telecommunication policies (service charges).

According to Republic of South Sudan (2012) report, there are a few institutions and government acts that regulate trade activities related to the oilseeds sector in South Sudan. For example, the South Sudan National Bureau of Standards (SSNBS) Act, 2012, provides a legal framework for the standardization of commodities and processes in South Sudan. In Uganda, CASA, (2020) pointed out that there is lack of awareness and enforcement of the sesame standards to protect public health and safety and the environment against dangerous, counterfeit and substandard products

According to FAO (2013), some of the enabling environment issues that are particularly relevant to Africa include the limiting effect of poor infrastructure facilities – roads, telecommunications, storage, energy generation, and distribution, among others – on agrifood chain competitiveness, taxes and tax management policies and practices and financial constraints. Similarly, FAO (2007) indicated that, the specific factors perceived as obstacles by firms in the nine focus countries (in Eastern European and Central Asian) of the regional review were economic uncertainty and instability, tax rates and administration, infrastructure and communication, cost of and access to financing, access to land, title or leasing land, and weak vertical coordination (contracting agreements) between different actors in the agrifood chain.

Table 2: Government Policies and Regulations Obstacles to Sesame Production and Marketing

Government policies and regulations that are obstacles to sesame production and marketing?	**Frequency**	**%**
High/excessive taxation rates	218	53.4%
Arbitrary tax rates imposition	117	28.7%
Arbitrary fines	99	24.3%
Market fees and charges	158	38.7%
Business registration and licensing procedures	93	22.8%
Regulations related to quality of sesame products	97	23.8%
Import/export taxes	127	31.1%
Export Permits	76	18.6%
Lack of national market information System	142	34.8%
Road blocks/ Police check points	139	34.1%
Limited public investment in roads infrastructure (trunk roads, rural/feeder roads)	123	30.1%
Lack of/inadequate off-farm storage	141	34.6%

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

Poor quality of market infrastructure and facilities	155	38.0%
Political instability and insecurity	103	25.2%
Weak local currency (SSP) against the US$	140	34.3%
High rates of price inflation	133	32.6%
Weak judicial system to enforce contracts and protect investments	84	20.6%
Difficult access to enough foreign currency from the formal banking system.	103	25.2%
None	119	29.2%

Source: Household survey, 2025

➢ *Public Infrastructure, Facilities and Services*

Regarding infrastructure and social services there is some access to the following in the study areas: mobile phone services (80.9%), road network (83.1%), medical/health facility (71.6%), public water supply (47.8%), ox-ploughing infrastructure (43.9%) and Payam Agricultural Department (35.3%). MTN is the only mobile network services provider in the study areas in Magwi County. Nonetheless, there is inadequate access to some important infrastructure and social services that are vital for production and marketing including: electricity services (0.2%) microfinance institution (0.5%:), banking facility (0.7%; technical college/vocational school (1.5%), ploughing infrastructure-tractor (5.4%) and market structures (8.8%). The aspects of supporting infrastructure and services that are obstacles for the agro-input dealer business include mobile phone networks (high user charges), poor road transportation system (trunk roads, rural/feeder roads) and the lack of water supply network at market place.

The World Bank (2019) believes that the South Sudan's transport network is extremely underdeveloped thus reaching markets with undamaged produce an especial challenge for farmers. More importantly, the absence of rural and feeder roads and, therefore, access to domestic, regional and international markets is a key bottleneck to increased agricultural production (AfDB, 2013). Likewise, in Uganda, access to feeder roads is also inadequate in many rural areas, affecting producers' access to physical markets (LTS, 2017).

Table 3: Infrastructure and Social Services Available in the Study Areas

Infrastructure and Social Services in the Study Areas	**Frequency**	**%**
Mobile phone service	330	80.9%
Public water supply	195	47.8%
Road network	339	83.1%
Ploughing infrastructure (animal draught ploughing)	179	43.9%
Ploughing infrastructure (powered tractor)	22	5.4%
Banking facility (e.g. bank, MFI)	3	0.7%
Microfinance institution	2	*0.5%*
Market structures	36	*8.8%*
Medical/health facility	292	71.6%
Technical college/vocational school	6	1.5%
Payam Agricultural Department	144	35.3%
None	15	3.7%

Source: Household survey, 2025

➢ *Business Support Services*

The business support services discussed in this section include input supply, extension and technical advisory services, market information and access to financial services.

- *Input Supply*

During the survey period in January 2025, stocks of sesame seeds were not available with the sole agro-dealer in Pajok Payam. Sesame seeds are usually procured from Uganda and sold to farmers during the cultivation season. The agrochemicals which the agro-input dealer procured from Uganda and supplied to farmers in the past 12 months were pesticides (Dudu Acelamatin and Dudu Cyper) and fertiliser (Urea and DAP). On the other hand, the tools and equipment available with input dealer during the survey included sickles, oxen-plough and hoes, axes, slashers and rakes, spade or shovel and Knapsack chemical sprayer (manual) all procured from Uganda. In South Sudan, there is limited access to production enhancing inputs, including improved sesame varieties and quality seeds due to a poorly developed input supply system (FAO, 2023).

Access to affordable inputs especially quality seed remains to be a challenge to the smallholder farmers in Somalia. Farmers end-up sourcing sesame seeds from the local market and/or recycle from the previous crop cycles or receive improved seeds from donor projects. Moreover, recycled seeds have less vigor contributing to poor production and productivity and are more prone to spread pests and diseases (SCALA, 2024). Whereas, the main input suppliers in the sesame value chain in Humera district of Ethiopia are Bureau of Agriculture and Rural Development (BoARD), Dedebit Credit and Saving Institution (DECSI), Humera Agricultural Research Center (HuARC), Ethiopian. Commodity Exchange

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

(ECX) market, Sesame Business Network (SBN), cooperatives, and processors. The major inputs supplied to the farmers in the district include improved seed, chemicals such as pesticides and fertilizers (Gebremedhn et al, 2019).

In Myanmar, about 10% of the sample farmers bought sesame seed from the market in Magway Township and 20% of the sample farmers bought sesame seed from neighboring farmers who had reserved seeds. Nonetheless, about 70% of the sample farmers used their own reserved sesame seed from the previous crop season. Whereas, farmers bought fertilizers, pesticides, and foliar fertilizers from the many shops which all sell chemical in Magway Town (Linn Thuzar,2013). In Uganda, Agro-input dealers and rural stockists have been supplying hand tools and equipment for ox ploughing together with seeds and fertilisers (CASA,2020),

Table 4: Agro-Chemicals, Tools and Equipment Available with the Agro-Input Dealer

S/N	Agro-chemical	Trade mark	Unit (liters)	Price/Unit (SSP)	Sources of supply
1	Pesticides	Dudu Acelamatin	100 ml	12,000	Uganda
		Dudu Cyper	100 ml	12,000	Uganda
2	Fertiliser	Urea	10kg	120,000	Uganda
		DAP	10 kg	120,000	Uganda
S/N	**Tools and Equipment**		**Unit (pc)**		**Price/Unit (SSP)**
1	Sickle		Pc		8,000
2	Oxen-plough		Pc		400,000
3	Hoe		Pc		25,000
4	Axes		Pc		30,000
5	Slashers		Pc		16,000
6	Rakes		Pc		20,000
7	Spade or shovel		Pc		20,000
8	Knapsack chemical sprayer (manual)		Pc		120,000
9	Machete (Panga)		Pc		16,000
10	Watering cans		Pc		20,000

Source: Household survey 2025

The challenges that prevented the input supplier to meet the demand of his clients/customers for farm tools, equipment and implements, seeds, packaging materials and agro-chemical he sells include the lack of own capital; lack of credit / credit is too expensive; high procurement cost of agro-chemicals, packaging materials, tools and equipment and seeds (supply); lack of means of transport and; poor road infrastructure; transport cost too high; high government taxes and levies high cost of store rents and; too much humanitarian assistance (free distribution of seeds and hand tools).

- *Extension and Technical Advisory Services*

There was poor access of sesame farmers in the targeted location to extension services from extension agents in the past 12 months. Only 24.8% of households had access to extension services and the sources of extension services included NGO (10.7%), County Agriculture Office and Payam Agricultura Office at 9.2% respectively. Lead farmers and training institutions played minor roles in extension delivery at 3.5% and 1.5% respectively.

This is in line with Summer (2020) report which indicated the lack of extension services for the sesame sector in South Sudan and no proper guidelines provided to small scale farmers aspiring to cultivate sesame. Similarly, in Yobe State in Nigeria, about 66.11% of sesame farmers in the study area had no contact with extension agents thus depriving them from accessing new technologies and improved varieties of inputs especially seed which would help to increase farmers output and translate to higher profit (Jonah, 2020).

In Mozambique, farmer access to public sector extension services declined from 13.5 percent in 2002 to 8.3 percent in 2014 due to reductions in funding. NGO and other donor-funded programming provide a large percentage of public sector extension services, however, most programs have poor coordination in overlapping beneficiary groups (USAID, 2016).

In Tanzania, about 47% of sesame producing households in the studied area did not obtain extension services. Moreover, the inadequate access to extension services may curtail sesame growers' acquaintance to information on enriched agronomic packages for sesame production and marketing practices (Lukurugu Gerald Alex et al., 2023).

Similarly, in Niger, farmers have limited access to extension services (one government agricultural extension agent for 50 villages or 35,000 people (Norell at al.,2017)

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

Table 5: Access to Extension Services and their Sources, by Sex of Household Head

Any access to extension services from extension agent	Male		Female		Total	
	Frequency	%	Frequency	%	Frequency	%
Yes	62	25.8%	39	23.2%	101	24.8%
No	176	73.3%	124	73.8%	300	73.5%
Don't know	2	0.8%	5	3.0%	5	1.7%
Total		**240**		**168**		**408**
Source of extension services	**Male**		**Female**		**Total**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
County Agriculture Office	15	6.4%	22	13.3%	37	9.2%
Payam Agriculture Office	18	7.7%	19	11.4%	37	9.2%
NGO	34	14.5%	9	5.4%	43	**10.7%**
Lead Farmer	6	2.6%	8	4.8%	14	3.5%
Training institution	2	0.9%	4	2.4%	5	1.5%
None	173	73.6%	120	72.3%	293	73.1%
Total	**235**		**166**		**401**	

Source: Household survey, 2025

- *Market Information Services*

About 58.3% of households had access to market information before selling their sesame in the past 12 months. The main types of market information accessed by households included: prices of sesame at different markets (55.9%), sesame quality standards (39.5%), market place information (34.6%), demand/potential buyers' information (31.1%) and supply/suppliers information (28.2%). However, about 36.0% of respondents indicated that they did not have access to market information.

Similarly, in the major sesame producing areas around North Western and South Western low lands of Ethiopia where there is poor communication network, the lack of adequate market information resulted in low bargaining position of farmers (Abebe, 2016). Overall, the access to market information in Uganda can be described as being generally poor (Dalipagic and Elepu, 2014). Nonetheless, there is a need to have a structured dissemination of information on improved production practices, market intelligence, value addition, better post-harvest handling and demands on quality and standards in different markets as this could lead to better returns to traders and farmers (Munyua et al., 2013).

Sesame farmers in Sudan face significant barriers to accessing information. There is a lack of accessible information about market value and pricing of sesame seeds, as these depend on pricing set by local traders and brokers through individualized agreements. Farmers reportedly have little access to market information and are uninformed of seasonal price developments or prices in markets outside of their area. Moreover, many agricultural workers do not have access to the internet or mobile phones. (ILO, 2022; cited in ETI Sweden, 2023)

Table 6: Access to and Types of Market Information Across the Study Areas

Any access to market information before selling your sesame in the past 12 months?	Total	
	Frequency	%
Yes	238	58.3%
No	166	40.7%
Don't Know	4	1.0%
Total	**408**	
Types of market information you have access to in the past 12 months?	**Frequency**	**%**
Prices of sesame at different markets	228	55.9%
Demand/potential buyers' information	127	31.1%
Sesame quality standards	161	39.5%
Supply/suppliers information	115	28.2%
Market place information	141	34.6%
Grading and labeling	53	13.0%
Phyto-sanitary and other certification for sesame seeds	20	4.9%
Other (specify)	0	0.2%
No access to market information	147	36.0%
Total	**408**	

Source: Household survey, 2025

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

The main sources of market information for smallholder farmers include from their neighbors (54.8%), by visiting the markets (48.4%), from local traders (46.2%) via radio (23.0%) and from County/Payam Agriculture Offices (15.6%). In Uganda, most farmers receive their information on prices through the local informal network: other farmers, local market and word of mouth. (Dalipagic and Elepu, 2014).

Table 7: Sources of Market Information Across the Study Areas

Sources of Market Information you Accessed in the Past 12 Months?	Frequency	%
Have no market information	47	11.6%
From neighbors	222	54.8%
By visiting the market	196	48.4%
From local traders	187	46.2%
NGOs	3	0.7%
County/Payam Agriculture Offices	63	15.6%
Radio	93	23.0%
Extension worker	22	5.4%
SMS system/mobile phone	17	4.2%
Newspaper	6	1.5%
Farmers' organizations/cooperative	18	4.4%
Not applicable	106	26.2%
Other (specify)	1	0.2%
Total	**405**	

Source: Household survey, 2025

- *Financial Services*

The majority (86.2%:) of household head did not take any loans from any sources, while 13.9% of respondents took loans/credits to buy improved seeds and other inputs for sesame production in the past 12 months. The main sources of loans/credits were friends and relatives (9.8%), Village Savings and Loan Association-VSLA (7.4%), Merry-go round savings groups and government bank at 6.5% respectively.

Access to finance for farmers in South Sudan is a daunting challenge both on the demand and supply side. On the demand side, barriers to access to formal financial services include deep distrust, distance, affordability as well as financial literacy. Whereas, the supply side is constrained by factors such as a weak financial infrastructure, lack of credit infrastructure, burdensome documentation requirements and the lack of product innovation (Altai Consulting (2019; cited in Eliste et al.,2022),

In Yobe State, Nigeria, the sources of fund used by the farmers in the production of sesame include from personal saving (61.11%), credit (8.33%), loan (10.56%), and gift (20.0%) (Jonah et al. 2020). On the other hand, Kassie et al., (2022), reported that in Ethiopia, very few sesame growers have access to the formal sources of finance and therefore smallholder farmers depend on informal sources, such as friends, relatives, and local money lenders.

Across the Somali peninsula, farmers in particular face several barriers and constraints in accessing finance, including requirements for collateral which a majority of smallholder farmers do not have and those who can access receive a limited loan size. This restricts the ability of value chain actors to make significant investments and scale their operations effectively(SCALA,2024).

On the other hand, Deutsche Bank Research (2014) pointed out that, rural households in Africa are still largely reliant, for their financial needs, on informal providers. Challenges to finance among smallholders include the number and variety of smallholders as well as the lack of security of land tenure (preventing land to be used as collateral). Whereas, in Tanzania, in the studied region the majority (88%) of sesame producing households had no access to financial assistance. Limited access to credit and other financial backing may deter growers' capacity to let labor and procure sesame cultivation inputs like seeds, pesticides, and fertilizers (Lukurugu Gerald Alex et al., 2023).

Limited access to financial and business services make it difficult for small rural enterprises to become suppliers to larger firms, compete in global value chains, and enter higher-value markets (ILO (2011).

Table 8: Access to Loans/Credit for Improved Seeds and Other Inputs for Sesame Production

Any loan taken for input purchases	Frequency	%
Yes	56	13.8%
No	350	86.2%
% of Total	**406**	
Source of your borrowing/loan in the past 12 months	**Frequency**	**%**
Friends and relatives	**36**	**9.8%**

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

Government Bank	**24**	**6.5%**
Private Bank	**17**	4.6%
Microfinance institution(MFI)	**2**	0.5%
Cooperative Society	**3**	0.8%
Village Savings and Loan Association-VSLA	**27**	7.4%
Farmer group/Association	**9**	2.5%
Informal money lender	**3**	0.8%
Merry-go round saving group	**24**	6.5%
Agro-Input dealer/trader	**1**	0.3%
None	**258**	70.3%
Own saving/self-financing	**14**	3.8%
Don't know	**27**	7.4%

Source: Household survey, 2025

C. Recommended Strategies to Remove Constraints in the Enabling Environment

Based on the findings of the study, we recommend the following strategies for the government, NGOs/CBOs and development partners to remove/alleviate constraints in the business enabling environment so as to strengthen the sesame value chain to enhance its positive impact on the food and nutrition security of smallholder's farmers. The recommendations are aggregated around business enabling environment challenges in production and marketing of sesame seeds and distribution of production inputs

- *Laws, Policies, Rules and Regulation, Public Infrastructure and Facilities*

Regarding the enabling environment (laws, policies, rules and regulation, public infrastructure and facilities) there is the need for the government to critically consider the following courses of action in order to ensure a conducive business environment for smallholder to produce and market their sesame in the study areas in Magwi County,

There is the need for government to remove or alleviate constraints in the enabling environment for smallholders, traders/distributors, processers and agro-input dealers and other market actors. The policy recommendations include: improved access to formal credits and loans; reduced level of taxation and market fees/ levies; abolish police checkpoints; establishment of unified tax regime; reduced levels of import/export taxes/duties and tariffs; and the review of the high telecommunication service charges.

The local, the state/national government authorities (e.g. South Sudan National Bureau of standards. Ministry of agriculture, Ministry of roads and transport, Directorate of Water and sanitation, Revenue/Tax Authorities, Telecommunication Authority, NGOs, UN Agencies, etc.).to ensure improved services delivery to producers and traders/distributor.

Increased public investment in public infrastructures including trunk roads, rural/feeder roads, telecommunication, off-farm storage, power generation, and improved market structures and facilities.

Establish and support a national marketing information system to capture and disseminate information on prices of sesame at different markets, sesame quality standards, market place information, demand/potential buyers' information and supply/suppliers information, grading and labeling, phyto-sanitary and other certification for sesame seeds and processed products. Disseminate the market information to farmers/producers and other stakeholders through NGOs, County/Payam Agriculture Offices, FM Radio, Extension workers, SMS system/mobile phone, farm bulletins, newspaper and via farmers' organizations/cooperative.

- *Improve the Delivery of Business Supporting Services*

The following recommended strategies aim to improve the delivery of business supporting services to enhance smallholders' production and marketing of sesame**.**

Smallholder farmers and traders/distributors often complained of lack of own capital and/or limited access to credits/loans and no national market information system. The deficiencies or lack of these supporting business supporting services need to addressed by the government to provide the necessary incentives and inform production and marketing of sesame products.

The findings of this study point to the limited use of both of formal and informal sources of loans/credit financial services among smallholders in the study area. A minority, 13.8% of smallholder rely on informal sources of finance including friends and relatives, village savings and loans association (VSLA) and to a limited extent farmers' associations, cooperative money lenders for buying seeds and other inputs for sesame production. Farmers need to be oriented and trained on how to make farming as a viable business which require them to make use of both formal and informal sources of agricultural finance to facilitate production, transportation and marketing of the sesame crop.

The government to facilitate access to lease financing to help farmers and cooperatives to buy agricultural machineries (ox-ploughs, wheel barrows, chemical sprayers, hoes and assorted hand tools, manual sesame oil presses, etc.) for improved efficiency and productivity.

Provide seed money to agro- dealers and/or village stockists to procure agricultural inputs and make them available within easy reach of smallholders. Encourage them to provide cash loans or in-kind credits (seeds, tools,

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

fertilisers, pesticides, bagging materials, etc) to producers for sesame production and marketing. The sesame crops to be sold through the input suppliers who deduct the value of the loans and credits from the proceeds of the sesame crop sales.

Facilitate the formation of sesame growers Village Savings and Loans Associations that will enable smallholders to save and take low interest loans which they can invest in sesame production, processing and marketing. Large/whole sale traders and agribusinesses to be encouraged to lend money to small farmers and medium farmers for accessing seeds and other inputs for production to be repaid in-kind (harvested sesame)

Strengthen and support Micro-Finance Institutions (MFIs) to allow farmers and farmers groups to access credit without collateral (group solidarity) for inputs procurement, production, marketing, transport and value addition.

Facilitate the establishment of ox-traction groups among the youth, train them on how to plough and provide them with revolving fund for accessing oxen or donkey and other related inputs. Ensure access of farmers and ox-traction group to improved veterinary services for their trained bullocks/oxen. Through their oxen ploughing services, the group is expected to contribute to the horizontal expansion of land under sesame and thereby ensure food security and marketable surplus for income generation.

The government in partnership with private entrepreneurs to consider establishing tractor rental services whereby farmers could be required to repay the services charges and fees in kind within with for example sesame harvest, within a six to eight months' period. Tractor rental services could enable farmers' access to timely ploughing services and to overcome the limitations of own labor and high cost of hired labor for land preparation.

Institutional and human capacity building for the public extension department and staff to deliver effective extension and advisory services to smallholder sesame farmers in Magwi County using variety of methods including radio, ICT, lead farmer's, farmer field schools, method and result demonstrations, exposure visits and field days. These interventions are expected to facilitate the adoption of the innovative crop husbandry practices among Smallholder farmers.

Improved access of smallholders to business support services including marketing advice and counseling, business legal services and awareness on compliance with quality standards advice, technical and business training, awareness on public health and safety, business plan development and 4fiaincial literacy.

IV. CONCLUSIONS

This study delved on identifying the impacts of the enabling environment on sesame production and marketing in the study areas and suggested strategies and policy options to remove constraints in the enabling environment and thus contribute to sustainable sesame production and marketing.

A total of 490 households were sampled in the study areas using multi-stage sampling techniques. In addition, individual quantitative survey was conducted with an agro-input dealer. The majority (90.20%) household heads fall in the age range 18-54 years, this age group are active and do make significant contribution to sesame production in the study areas. About 34.4% of households had some and completed primary education while, 45% did not complete and completed secondary education. The low mean of 4.6 adult members (18 years and above) in the households in the study area could have implication for their access to adequate family labor especially during peak labor demand periods.

The findings of the study indicated that the major government policies and regulations that are obstacles to smallholder's sesame production and marketing include high/excessive taxation rates (53.4%), exorbitant market fees and charges (38.7%) and poor quality of market infrastructure and facilities (38.0%), the lack of national market information system (34.8%), lack of/inadequate off-farm storage (34.6%), road blocks/ police check points (34.1%), import/export taxes (31.1%), the limited public investment in roads infrastructure (30.1%) and arbitrary tax rates imposition (28.7%). There are also certain government policies and regulations that have particularly impacted on agro-dealers and these include: excessive tax rates and levies; roadblocks/police checkpoints on internal trade,; exchange rates management; telecommunication policies (exorbitant service charges); and high procurement cost of agro-chemicals, packaging materials, tools and equipment and seeds (supply) due to high export/import duties and tariffs charges; lack of means of transport and; poor road infrastructure; transport cost too high; high cost of store rents; and too much humanitarian assistance (free distribution of seeds and hand tools.

On the other hand, there are gaps in the availability and access to vital infrastructure and social services for production and marketing including: electricity services (0.2%) microfinance institution (0.5%:), banking facility (0.7%; technical college/vocational school (1.5%), ploughing infrastructure-tractor (5.4%) and market structures (8.8%). Specifically, agro-dealers have been impacted by high user charges for mobile phone browsing, poor road transportation system (trunk roads, rural/feeder roads) and the lack of water supply network at market places.

Regarding business supporting services in the study areas, there was a sole agro-input dealer who trade in sesame seeds, farm tools and equipment, packaging materials and agro-chemicals. Whereas, the majority (73.5%) of farmers did not have access to extension services, while, 40.7% did not obtain market information on prices, supply/demand conditions and market place before selling their sesame. On the other hand, the majority (86.2%) of household head did not take any loans to buy improved seeds and other inputs for sesame production. For those who accessed loans/credits the main sources were friends and relatives (9.8%), Village Savings and Loan Association-VSLA (7.4%), Merry-go round savings groups and government bank at 6.5% respectively.

Overall, this study provides evidence that challenges in the enabling environment impacted on production and

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

marketing of sesame for smallholder as well as on the trading activities of agro-dealers in the study area. The study suggested a number of strategies and policy options to remove or alleviate the impacts of the enabling environment on smallholders and traders/distributor. These among others include the review of public laws, policies, rules and regulation, improved availability and provision of public infrastructure and the enhanced delivery of business supporting services including input supply, extension and advisory services, market information and improved access to formal/informal financial services. These measures if properly formulated and implemented are expected to contribute to engendering sustainable production and marketing/distribution of sesame in the study areas**.**

REFERENCES

[1]. Abebe Terefe Negasa (2016). Review of Sesame Value Chain in Ethiopia. International Journal of African and Asian Studies www.iiste.org ISSN 2409-6938 An International Peer-reviewed Journal Vol.19, 2016

[2]. African Development Bank (2013). South Sudan; An Infrastructure Acton Plan. https://www.afdb.org/sites/default/files/documents/projects-and operations/south_ sudan_infrasatructure_action_plan_a_program_for_suatained_strong_economice_growth_-full_report.pdf

[3]. Altai Consulting (2019). Mobile money ecosystem survey in South Sudan – exploring the current and future potential of using mobile money for effective humanitarian and development cash programming. World Bank, Washington, D.C.

[4]. CASA (2020). Sesame Sector Strategy – Uganda. CASA Uganda Country Team, April 2020

[5]. Dalipagic and Elepu (2014). Agricultural Value Chain Analysis in Northern Uganda: Maize, R Dawit DA (2020). An Overview of Data Analysis and Interpretations in Research. Inter. J. Acad. Res. Educ. Rev. 8(1): 1-27ice, Groundnuts, Sunflower and Sesame, ACF 2014

[6]. Dawit DA (2020). An Overview of Data Analysis and Interpretations in Research. Inter. J. Acad. Res. Educ. Rev. 8(1): 1-27

[7]. Deutsche Bank Research (2014). Agricultural value chains in Sub-Saharan Africa. From a development challenge to a business opportunity. April 2014, Deutsche Bank Research Frankfurt am Main

[8]. Devaux André, Torero Maximo, Donovan Jason, and Horton Douglas (2016). Innovation for Inclusive Value-Chain Development: Successes and Challenges. International Food Policy Research Institute (IFPRI), April 2016

[9]. Dossa Komivi, Konteye Mariama, Niang Mareme, Doumbia Youssouf and Cisse Ndiaga (2017). Enhancing sesame production in West Africa's Sahel: A comprehensive insight into the cultivation of this untapped crop in Senegal and Mali

[10]. Eliste, P., Forget, V., Veillerette, B., Rothe, A.-K., Camara, Y., Cherrou, Y., Ugo, E. and Deng, S. (2022). Transforming agriculture in South Sudan- From humanitarian aid to a development oriented growth path. Rome. FAO and the World Bank,https://doi.org/10.4060/cc1048en

[11]. ETI Sweden (2023) Sesame Seeds in Sudan. Human rights risks linked to hummus and tahina

[12]. Evaluation Knowledge Study (2012). Support for Agricultural Value Chain Development, Reference Number: EKS:REG 2012-15 Independent Evaluation: EK-3. Independent Evaluation Department's website (www.adb.org/evaluation

[13]. FAO (2007). Enabling Environments for Agribusiness and Agro-Industry Development in Eastern Europe and Central Asia. Proceedings of FAO Workshop Budapest, Hungary 30 November - 2 December 2006. Regional Office for Europe and Central Asia FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS ROME, ITALY

[14]. FAO. 2013. Enabling environments for agribusiness and agro-industries development – Regional and country perspectives. Rome.

[15]. FAO (2022). Crop and Food Supply Assessment Mission (CFSAM) to the Republic of South Sudan, 20 March 2023.

[16]. FAO (2023). Hand-In- Hand Initiative, South Sudan Investment Case, World Investment Forum, South Sudan 3.10.2023.

[17]. FAO and WFP, (2025) 2024 FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to the Republic o4f South Sudan

[18]. Feed the Future (2017). Enabling Environment for Food Security Project Enabling Environment in Market Systems Technical Note. Africa Market Systems Global Learning and Evidence Exchange (GLEE) June 2017

[19]. Feed the Future. (2017a). The US Government's Global Hunger and Food Security, 2017. Building an Enabling Environment for Agricultural Transformation and Market Development Global Learning and Evidence Exchange-Market Systems. Bangkok, Thailand

[20]. FEWS NET (2018). Livelihoods Zone Map and Descriptions for the Republic of South Sudan. Washington, DC: FEWS NET.

[21]. Gebremedhn Mengstu Berhe, Tessema Worku, Gebre Girma Gezimu, Mawcha Kahsay Tadesse & Assefa Mewael Kiros (2019) Value chain analysis of sesame (Sesamum indicum L.) in Humera district, Tigray, Ethiopia, Cogent Food & Agriculture, 5:1, 1705741, DOI: 10.1080/23311932.2019.1705741

[22]. GTZ (2007). Value Links Manual-The Methodology of Value Chain Promotion

[23]. ILO (2011). Value Chains for Rural Development. Rural Policy Briefs. Rural Development Through Decent Work

[24]. ILO, 2022. 'Extension of social protection coverage to workers in the informal economy in Sudan': https://www.ilo.org/wcmsp5/groups/public/--- dgreports/--- ddg_p/documents/publication/wcms_856609.pdf).

[25]. International Trade Fair (2024). Republic of South Sudan National Export and Investment Strategy 2024-2028 Oilseeds

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan261

[26]. JICA (2015). Comprehensive Agriculture Master Plan (CAMP), Final Report Annex IV Situation Analysis Report 2013/2015, May 2015
[27]. Jonah Samuel E. Shettima Baba G., Umar, Abba S. S. and Timothy Enan (2020) Sesame Production in Yobe State, Nigeria. American Journal of Economics ISSN 2520-0453 (online) Vol.4, Issue 2, pp 46 - 69, 2020
[28]. Kassie Girma T, Worku Yonas, Bachewe Fantu, Asnake Woinishet, and Abate Gashaw (2022) Scoping Study on Ethiopian Sesame Value Chain
[29]. Linn Thuzar (2013). Value Chain Analysis of Sesame in Magway Township. Mekong Institute Research Working Paper Series 2013, December, 2013
[30]. LTS International (2017). Uganda: Country Value Chain and Market Analysis Report. Sector Analysis Studies for the Commercial Agriculture for Smallholders and Agribusiness Programme20 November 2017
[31]. Lukurugu Gerald Alex, Nzunda Joseph, Kidunda Bakari Rashidi, Chilala Rahma, Ngamba Zabron Samson, Minja Athanas, Kapinga Fortunus Anton (2023). Sesame production constraints, variety traits preference in the Southeastern Tanzania: Implication for genetic improvement. Journal of Agriculture and Food Research 14(2023)100665
[32]. Munyua B., Orr A., Okwadi J., (2013). Open Sesame: A Value Chain Analysis of Sesame Marketing in Northern Uganda, Series Paper Number 6, International Crops Research Institute for the Semi-Arid Tropics (lCRISAT) 7/20/2013
[33]. NBS (2015) Population Projections by County: 2015–2020. National Bureau of Statistics. Juba, South Sudan. March, 2015.
[34]. Ndou Portia, Taruvinga Bridget, Du Plooy Christian P., Ramusandiwa Tshililo & Mokwala Michael (2021). Enabling Environment for Inclusive Horticultural Value Chain for Smallholders in Gauteng Province, South Africa. Journal of Agricultural Science; Vol. 13, No. 2; 2021 ISSN 1916-9752 E-ISSN 1916-9760 Published by Canadian Center of Science and Education
[35]. Republic of South Sudan. (2012). National Bureau of Standards act, 2012. https:// www.wto.org / english / thewto_e / acc_e / ssd_e / wtaccssd6_leg_30.pdf
[36]. Rukwe, D.T, Aboki, E, Luka, P. and Nyam, C. M.L (2020) Economics of Sesame Production among Small Scale Farmers in Southern Part of Taraba State, Nigeria. Journal of Agricultural Economics, Environment and Social Sciences 6(1):103 – 112 June, 2020.Copy Right © 2015.
[37]. SCALA Private Sector Engagement Facility Report (2024). Sorghum, Maize, and Sesame Value Chains in Somalia
[38]. Sharon, O. A. (2016). Economic analysis of Sesame Production among Small- Holder farmers in Benue State, Nigeria. M.Sc Agricultural Economics Thesis. Ahmadu Bello University, Zaria, Nigeria.
[39]. Shriver Jefferson, Ferris Shaun and Barthmaier Dan (2019). Value Chain Toolkit: HARNESSING THE POWER OF MARKETS TO DRIVE CHANGE. Catholic Relief Services, DECEMBER 2018
[40]. Smith, D, Dyer, R, and Wandschneider, T (Eds.) 2020. Making Value Chains Work Better for the Poor: A Tool book for Practitioners of Value Chain Analysis. ACIAR Monograph No. 212. Australian Centre for International Agricultural Research, Canberra.
[41]. Summer (2020). South Sudan Agricultural value chain – challenges and opportunities (Final)
[42]. UNDP (2023). STRENGTHENING AGRICULTURAL VALUE CHAINS & AfCFTA LINKAGES IN SOUTH SUDAN: Opportunities and Challenges. FINAL REPORT FEBRUARY 2023
[43]. UNIDO (20l9) Enhancing social stabilization and cohesion through supporting agro value chain development in South Sudan
[44]. USAID (2016). Mozambique Agricultural Value Chain Analysis. LEO REPORT # 31
[45]. USAID (2025) Enabling Agricultural Trade Project, USAID-EAT Final Report, 2015.
[46]. Whitepeak (2023) Golden Oilseeds of South Sudan: Groundnuts and Sesame, 17 March 2023|Agriculture, Monitoring and Evaluation, Research & Advisory.
[47]. World Bank (2019). South Sudan Linking the Agriculture and Food Sector to the Job Creation Agenda Agriculture Global Practice East and Southern Africa Unit (GFA13) Sustainable Development Practice Group World Bank June 2019
[48]. World Bank. (2004). World Development Report 2005. A better investment climate for everyone. Washington, DC. http://siteresources.worldbank.org/intwdr 2005/ resources/complete_report.pdf
[49]. World Bank (2020). Sudan Agriculture Value Chain Analysis (2020), Agriculture Global Practice Finance, Competitiveness and Innovation Global Practice, June 2020.
[50]. Yamane (1967). Formula for Sample Size pdf
[51]. Yuga ME and Wani J (2022). Soil Fertility and Farming Systems Assessment in Productive Areas of Western, Central and Eastern Equatoria State, South Sudan, SunText Rev Arts Social Sci 3(2): 138