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New Alliance Policy Acceleration Support: Malawi Project (NAPAS: Malawi)

Systematic Analysis of Groundnut Production, Processing and Marketing in Malawi

Christone J. Nyondo, Flora J. Nankhuni and Nathalie Me-Nsope

Introduction

A groundnut value chain study was commissioned by the Government of Malawi to identify priority investments for commercial up-scaling of the groundnut sub-sector, using support of the New Alliance Policy Acceleration Support (NAPAS: Malawi) Project. This study summarizes the findings of the groundnut value chain study.

Methodology and Data

The methodology included undertaking a detailed literature review to identify data and knowledge gaps and conducting field surveys and focus group discussions to collect primary data. A total of 293 farmers, 22 farmer groups, 56 market retailers, 21 intermediate traders, 14 processors, 10 extension workers and other key informants were interviewed. A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis and profitability analyses at smallholder farmer and trader levels were conducted. Secondary data was also analyzed to understand production and marketing trends.

Importance of Groundnuts in Malawi

Literature review and secondary data revealed that groundnuts are the most widely produced legume crop in Malawi. In 2016/17 season, groundnuts occupied the largest area under legume and pulses cultivation (29%), followed by common beans (25%), pigeon peas (21%), soya beans (14%), and cowpeas (8%). In terms of volume of legumes and pulses produced, groundnuts were the second most important grain legume accounting for 29% of the total volume produced of legumes and pulses in the 2016/17 season. Pigeon peas were the most important, making up 35% of total volume (MoAIWD APES 2016/17).

Key Findings

- Groundnut productivity is very low due to farmers' inability to economically access certified seed and follow recommended agronomic practices.
- The groundnut seed market in Malawi is underdeveloped partly due to weak effective demand for improved seed. The low demand for certified seed is also partly caused by the dual problem of high seed rate in groundnuts (80 – 100 kgs needed per ha, depending on variety) and low seed multiplication ratio.
- The formal output market system is also underdeveloped with less than 1% of total traded groundnuts being marketed through structured markets – contributing to low production and productivity as it fails to avail farmers the opportunity to sell at high lean season prices.
- Aflatoxin contamination is a major problem affecting peoples' health and lucrative markets access. Studies show that 6,344 deaths in Malawi can be attributed to aflatoxin-induced liver cancer. These deaths are estimated to cost the Malawi economy between US\$25 million to US\$1.3 billion annually (excluding costs associated with lost export markets).
- For Malawi groundnut value chain to be up-scaled, heavy investments are needed in the seed and extension systems. Varieties developed need to target Malawi manufacturing sector and export markets demands. Heavy investments in aflatoxin contamination control are also needed.
- Malawi also needs to explore and take full advantage of regional export markets and invest to formalize and regulate the existing large informal regional export market.



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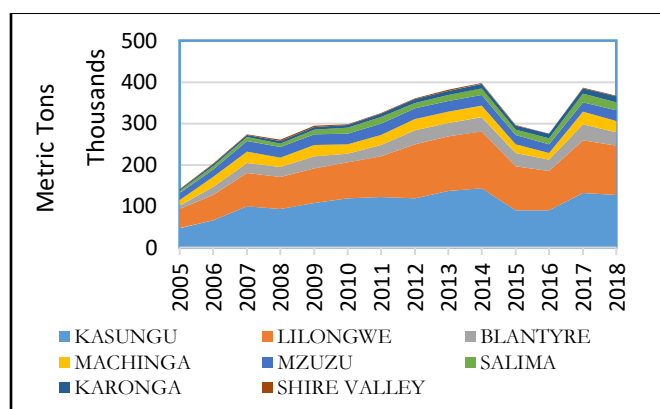
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Some of the favorable attributes of groundnuts include contributing to soil fertility through biological nitrogen fixation and providing a rich source of digestible crude protein, energy, minerals and vitamins (Simtowe, et al., 2010).

Groundnuts Production in Malawi

The study results show that Kasungu and Lilongwe Agricultural Development Divisions (ADDs), located in the Central region, account for more than half of the country's total production of groundnuts. The main producing districts in these two ADDs are Lilongwe, Kasungu, Mchinji, Ntchisi and Dowa. Figure 1 presents estimated groundnut production in metric tons by ADD between 2004/05 and 2017/18 agricultural seasons.

Figure 1: Groundnut production by Agricultural Development Divisions (2004/05-2017/18)



Source: MoAIWD Agricultural Productions Estimates Survey (APES) data.

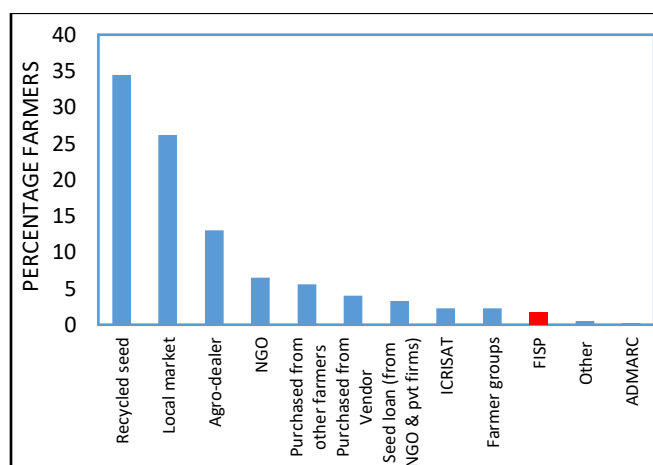
Note: 2018 data is from 2nd round estimates of the 2017/18 season while other years' data are 3rd round (final) production estimates. Also note Blantyre, Machinga and Shire Valley ADDs are in the Southern region, Lilongwe, Kasungu and Salima ADDs are in the Central region while Karonga and Mzuzu ADDs are in the Northern Region.

Smallholder production systems exclusively rely on rain-fed agriculture. The reliability of rainfall in a particular season determines whether or not there would be a successful groundnut harvest, as reflected in the 2014/15 - 15/16 seasons in Figure 4 when El Nino caused droughts and flooding that affected production negatively. Dry spells are also expected to cause the decrease in 2017/18 season.

Groundnut Yields and Production

The yields are low; averaging 0.99 Mt/hectare in 2016/17 season (MoAIWD, APES, 2017). The major contributing factors are widespread recycling of groundnut material for seed and poor agronomic practices (among others). Compared to other legumes and pulses, groundnuts require the greatest amount of seed per unit area (high seed rate) but have a very low multiplication ratio. According to Key Informants Interviews (KIIs), the seed rate is at least ten times more than that of pigeon peas, while the multiplication ratio is at least four times lower. For example, farmers require between 80 to 100 kgs of seed per hectare (compared to only 10kg per hectare for pigeon peas). As a result, the majority of smallholders are unable to economically access adequate quantities of certified groundnut seed; and the private sector has found it difficult to develop a commercially viable seed market for groundnuts. In fact, the main source of seed for the farmers that were interviewed for this study was "recycled seed" (Figure 2).

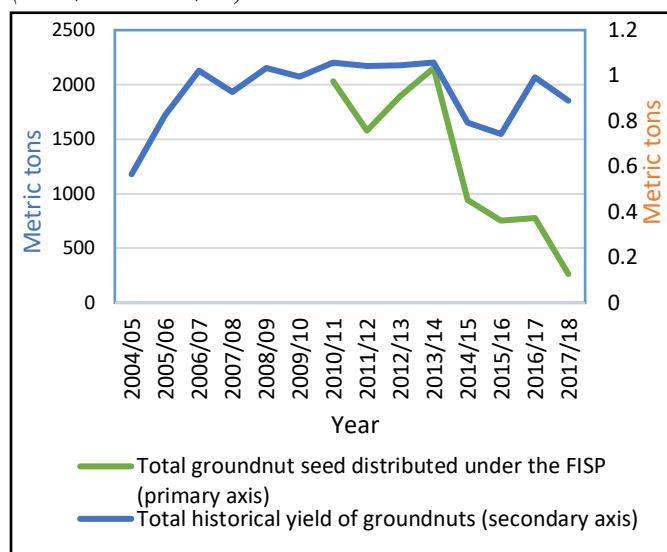
Figure 2: Percentage of farmers accessing seeds or planting material from different sources



Source: NAPAS, Groundnut Value Chain Study Survey, 2017

In order to address these problems, government has since the 2010/11 agricultural season incorporated a groundnut seed pack in the Farm Inputs Subsidy Programme (FISP). However, as suggested by Figure 2 above, few of the farmers are beneficiaries to the groundnut seed subsidies. This could be the reason why the distributed seeds do not seem to affect/improve groundnut yields (Figure 3).

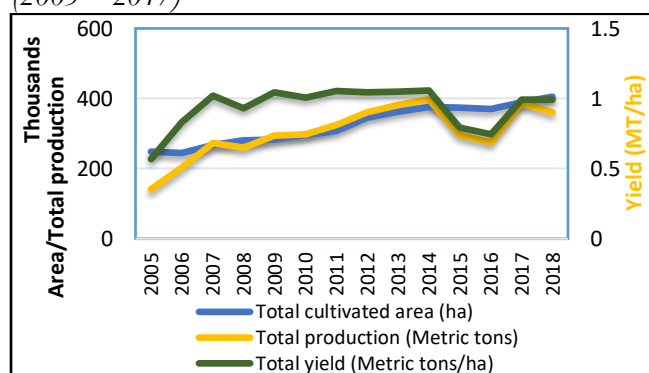
Figure 3: Total groundnut seed distributed under the Farm Input Subsidy Programme (2010/11 - 2017/18) and Average Yield (2004/05 - 2017/18)



Source: MoAIWD Agricultural Production Estimates (APES) data and MoIWD Farm Inputs Subsidy Programme (FISP) Reports (2010/11 – 2017/18). 2018 the data is from second round estimates of the 2017/18 season while all the other years' data are final (third round) production estimates.

However, area under cultivation has been increasing steadily over the years while yields have mostly remained stagnant (Figure 4). Increasing productivity should be one of the main goals in the sector.

Figure 4: Total production, yield and area under cultivation (2005 – 2017)

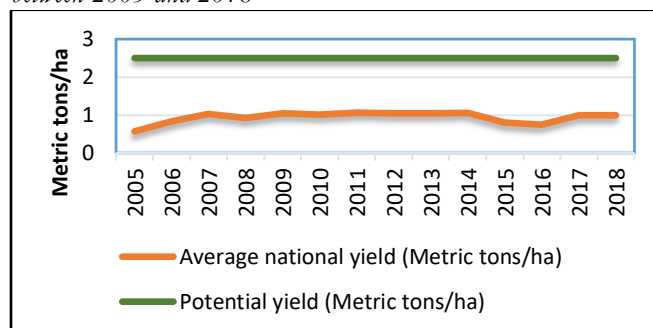


Source: MoAIWD Agricultural Production Estimates Survey (APES) data. 2018 data are second round estimates.

The maximum average potential yield for available varieties in Malawi is 2.5 MT/ha. This yield potential is based on the ridge and plant station spacing of 75cm x 75cm and 10cm x 10cm, respectively that is recommended by government. As shown in Figure 5

the current productivity levels are far below their potential.

Figure 5: Comparison of potential yields and average national yields between 2005 and 2018



Source: MoAIWD Agricultural Production Estimates Data (2017). 2018 Figure is based on second round estimates of hectare and production estimates while 2005-2017 figures are based on third round (final) estimates.

However, interviews with stakeholders suggest that the yield gap could even be wider than that shown in Figure 5 because the potential yield can actually be further increased to at least 3.5 MT/ha with strict adherence to recommended management practices, such as using certified seed, foliate, inoculant, gypsum and intensified non-ridge production on a plant spacing of 32cm x 10cm. Among other things, the current farming practices will have to be significantly adjusted to improve yield and start closing the yield gap.

Domestic Consumption and Quality of Groundnuts

In terms of consumption, an estimated 60% of locally produced groundnuts are consumed at household level, mostly in the form of roast groundnuts or Nsinjiro (groundnut flour), a condiment in local dishes. The hand shelling, involved prior to roasting or processing into Nsinjiro, usually involves the sprinkling of water onto groundnuts to soften the shell for easier shelling. According to Rios, et al., (2008), Gokah et. al., (2013) and Emmott (2012), this common practice increases the risk of aflatoxin contamination by about 73%. The European Union (EU) set a maximum tolerable limit of aflatoxin contamination of 4 parts per billion (ppb) (approx. equivalent to 0.1µg/kg) for food safety purposes. Studies in Malawi have found aflatoxin levels in the ranges of 1.6 – 2.9µg/kg in 64-75% of locally produced or imported groundnut-based therapeutic

foods and 34.2-115.6µg/kg in locally processed peanut butters and roasted groundnuts (Matumba et al., 2014; Monjo et al., 2009). These levels of contamination significantly reduce the suitability of locally produced groundnuts for human consumption. They also pose a significant threat to human health that needs to be addressed with urgency. Studies show that 6,344 deaths in Malawi can be attributed to aflatoxin-induced liver cancers. These deaths are estimated to cost the Malawi economy between US\$25 million to US\$1.3 billion annually (Monjo et al., 2009). This cost excludes the loss from lost export trade opportunities.

Industrial Processing and Prospects for Growth

At industrial level the processing of groundnuts is mostly concentrated in the transformation of groundnuts into groundnut-based products, such as, peanut butter, confectionary nuts, and blanched nuts. A limited proportion of paste made from groundnuts is also processed into therapeutic food products, such as, 'Ready to Use Therapeutic Foods (RUTP)', by a processor called Valid Nutrition. According to Key Informants to this study, the pervasiveness of low quality groundnuts in Malawi has limited the amount of locally produced groundnuts that can be used for therapeutic foods. This has at times forced therapeutic food makers to externally source groundnuts paste for use in their production processes.

Key Informant Interviews also revealed that Malawi has excess capacity for crushing groundnuts into oil. However, most industrial edible oil producers indicated preferring using sunflower seed and soybeans to groundnuts because these have a much higher oil yield than groundnuts. The overwhelming majority of farmers in the groundnut value chain survey choose their varieties based on other biological factors, such as, their gestation period (either shorter/longer maturation period) and not market factors/preferences. This suggests that Malawi will have to develop varieties with higher oil content to match the needs of the processing industry.

The farmgate production value of the domestic groundnut market is estimated to grow from the current US\$123 to at least US\$400 million per annum

within ten years (Longevity Development, 2017). This growth would be driven by significant growth in domestic household consumption, due to significant growth in population and industrial demand. Dzanja et. al., 2016 estimates population induced demand for direct consumption to grow by 7.1% per annum by 2025. Longevity Development indicates that industrial demand, which currently absorbs at least 30% of total production, can potentially expand two to threefold if supplied with the quality and consistency they need year round. Considering that the estimated farmgate value does not include the value of processed derivative products, the prospects for growth of the value chain are very encouraging.

Community Level Processing of Groundnuts

Despite the shunning of producing oil from groundnuts by large companies, there is some localised production of cooking oil from groundnuts by rural enterprises e.g. through initiatives, such as, 'One Village One Product' (OVOP). The majority of the groundnut oil produced at this level is supplied directly to the local community. Further analysis of this node of the value chain suggests that the oil produced by these enterprises goes through very little quality control certification processes because of the non-existence of Malawi Bureau of Standards (MBS) certification systems in local communities. In view of the threat posed by aflatoxin contamination, the lack of proper quality controls is an important food safety issue that needs to be addressed by authorities.

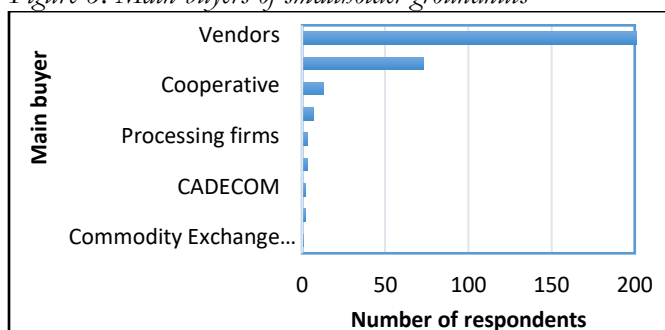
Emmott and Stephens (2012), argue that aflatoxin contamination would not be an issue at industrial processing of groundnut oil because aflatoxin can be easily filtered out through a simple filtration process. The issue at local community level is that rural enterprises do not normally have the right processing facilities and knowhow to eliminate aflatoxin in the processing phase of the final product. Additionally, if non-compliant nuts were used in oil processing, the risk posed by aflatoxin contamination means that the groundnut cake or paste resulting from oil pressing at community level may not be suitable for consumption without further treatment.

Groundnut Markets and Price Variability

Roughly, 25% of locally produced groundnuts are traded in the domestic market and 15% in the regional market (FAO, 2014; Emmott & Stephens, 2012; Chemonics International, 2009). Recent statistics suggest that most of this trade is informal as only about 1% of total traded groundnuts is marketed through the commodity exchange market system.

The majority of producers sell their groundnuts informally to vendors through informal market channels during the harvest season, at a time when prices are much lower, due to the lack of better storage facilities and pressure for liquidity by smallholder farmers. Moreover, few farmers seem not to be aware of the existence of structured markets. (Figure 6).

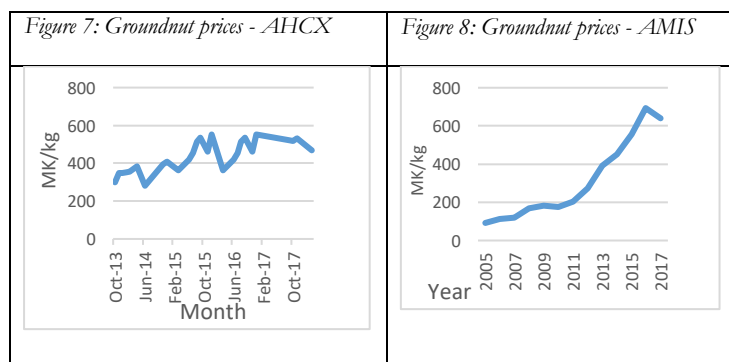
Figure 6: Main buyers of smallholder groundnuts



Source: NAPAS Groundnut Value Chain Survey Data, 2017

In addition, there does not seem to be a price benefit in selling to a commodity exchange relative to selling to vendors (See Figure 7 and Figure 8).

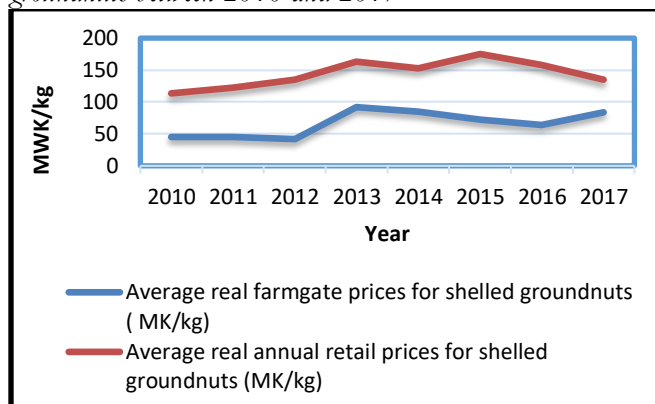
Among other things, the absence of well-developed structured markets, seasonality of production and dominance of informal trade have resulted into high price variability between farmgate and lean season prices (Figure 9).



Source: Auction Holdings Commodity Exchange and MoAIWD AMIS, 2018.

As shown in Figure 9, lean season prices for shelled groundnuts can at times be more than twice those of farmgate prices. Moreover, a bad harvest is usually accompanied by extremely high lean season prices

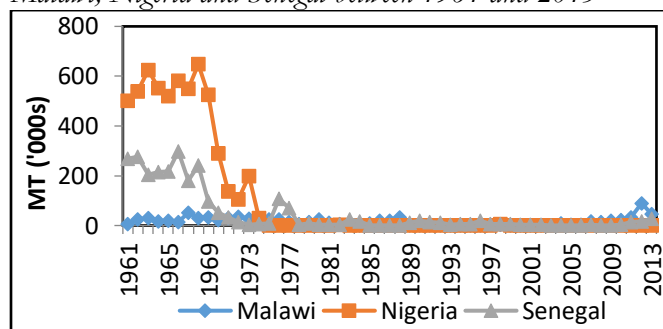
Figure 9: Comparison of domestic market price variation between real farmgate and spot (retail) market prices for shelled groundnuts between 2010 and 2017



Source: MoAIWD Agricultural Management Information System (AMIS) Data

In terms of overseas exports, Malawi's exports of groundnuts, just like those of any other African country, collapsed prior to the 1990s' due to the failure to meet stringent quality measures imposed by the overseas market to counter aflatoxin contamination (see Figure 10).

Figure 10: Trends in groundnut export quantities across Malawi, Nigeria and Senegal between 1961 and 2013



Source: FAOSTAT (2017)

Profitability Analysis

The average yield of farmers sampled into the groundnut value chain study was estimated at 600kgs/ha and the average unit farmgate price at MK440/kg for the 2016/17 season. Though this yield is not representative of the population of groundnut farmers in Malawi, it is a rough estimate of low input farmers across the country. Low input farmers are resource constrained farmers with inadequate access to quality seed and extension support. Based on this unit price, yield level and total variable costs, the gross return on investment can be estimated to be a mere MK20,056/ha, which is about 7% gross margin per annum for a smallholder farmer. If storage costs are not significantly high, the gross margin could rise further because lean season market prices recorded in AMIS (MK795/kg) are almost twice as high as the average farmgate prices. In terms of price/value changes along the groundnut value chain (

Figure 11) the percentage price change is biggest at the trader to supermarket level where the unit price charged by supermarkets is at least 141% more than that received by the intermediate traders/vendors.

Figure 11: Price/value changes along the groundnut value chain

	Farmer	Trader /vendor	Supermarket/ Retailer	Processor				
				Cooking oil*	Nsiniro	Roasted nuts	Peanut butter	Sibu
Average raw/processed groundnut prices (MK/kg)	440	620	1,500	1,600	1,780	2,347	3,430	4,17
Percentage price change	Base	41%	141%	14%	27%	32%	46%	22%
Farmer to processor			240%	264%	305%	433%	480%	848%

Source: Groundnut value chain study survey, 2017

Notes:

*The price of cooking oil is per litre

*Sibusiso is a form of therapeutic supplementary food product

The price gap increases further at the processor level of therapeutic groundnut products (Sibusiso), where the price is more than 9 times the price a farmer receives at farmgate. This information suggests that the common belief that vendors exploit farmers may just be a myth.

Conclusions and Policy Implications

The study has shown that groundnuts are a popular crop among smallholder farmers in Malawi. Groundnuts are also a nutrition enhancing product. Improving the groundnut value chain will have significant poverty reducing and nutrition enhancing effects for Malawi.

Malawi has to deal with low productivity of the crop and the aflatoxin safety issues. Malawi also has to strategize on increasing groundnut use in the domestic industry and penetrating regional and overseas markets. To improve productivity, Malawi has to improve farmers' access to quality certified seed and extension support by investing heavily in the seed and extension systems. The safety and market potential of groundnuts also needs to be enhanced. In addition, regional export markets have to be exploited and formalized for the country to benefit from the foreign exchange and government revenue that can be generated.

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This brief summarizes results of the groundnut value chain study by Christone J. Nyondo, Flora J. Nankhuni and Nathalie Me-Nsope, 2018, “Groundnut Production, Processing and Marketing in Malawi” that was undertaken by the NAPAS: Malawi Project to inform the formulation and implementation of the National Agriculture Investment Plan (NAIP) of the Ministry of Agriculture, Irrigation and Water Development (MoAIWD). The research paper will be posted on FSP’s [website](#).

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