



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

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

Is the Future of Malawi's Pigeon Pea Industry at the Mercy of India? An Analysis of Malawi's Pigeon Pea Value Chain

Flora J. Nankhuni and Nathalie M. Me-Nsope

Introduction

The Government of Malawi (GOM) approved the National Agriculture Policy (NAP), which is the overarching policy for the agriculture sector of Malawi, in September 2016. The NAP spells out the vision for a transformed agriculture sector that will be a key engine for economic growth and development of the country. To achieve the goal and objectives of the NAP, the sector must make strategic investments in various value chains that have the potential for sustainable and inclusive economic growth. As part of making the right investments, the GOM developed the National Agriculture Investment Plan (NAIP), using an evidence-based approach to prioritize investments in the sector. Therefore, the GOM with the support of the New Alliance Policy Acceleration Support, Malawi Project (NAPAS: Malawi) ordered a series of value chain studies to help the process of identifying priority value chains for investment in the agriculture sector during implementation of the NAIP. Among the identified value chains is the pigeon pea value chain.

Methodology and Data

The study began with a review of literature on Malawi's pigeon pea sector that was proceeded by fieldwork in February of 2017. Two-hundred and thirty-one (231) individual surveys were conducted with pigeon pea farmers across the regions, districts and EPAs in Malawi. Twelve focus group discussions with farmer groups, 41 interviews with pigeon pea retailers, 9 interviews with extension workers, and several key informant interviews (KIIs) with other value-chain actors such as seed systems actors, exporters and processors, government officials, representatives of NGOs and representatives of the two commodity exchange markets in Malawi, were also conducted. The data from the fieldwork provided challenges faced by value chain actors. A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis and price and profitability analyses were conducted. Secondary data was also analyzed to understand production and marketing trends.

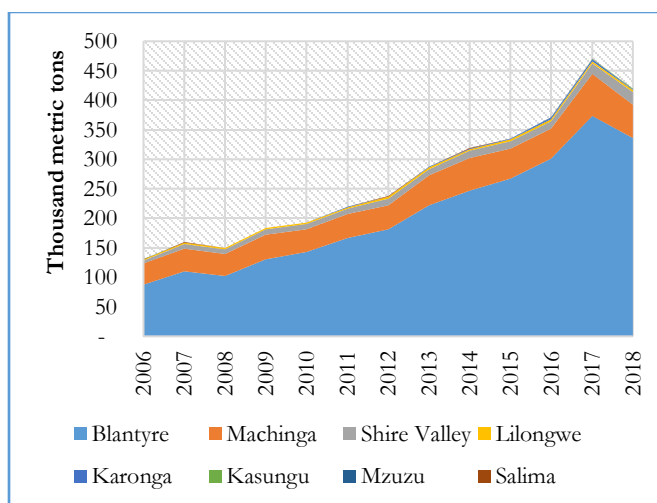
Key Findings

- Pigeon pea production and yields have increased steadily over the years, making it the most important legume crop accounting for 35% of total legume production in Malawi, in 2016/17.
- It is mostly grown in the Southern region of Malawi while crop suitability maps indicate that the Central and Northern regions are relatively more suitable.
- The crop is grown on small pieces of land (on average 0.5 ha/household) and is mostly intercropped with maize.
- Some of the constraints include: limited access by farmers to improved seed varieties partly due to limited availability of the seeds and limited access to financial resources to enable the farmers purchase the seeds; limited access to extension by farmers; pest and disease attacks that are not managed; low farm gate prices, and limited access to markets.
- India is the largest importer of pigeon pea from Malawi. However, data is not available to show how much of the crop crosses Zambia, Tanzania and/or Mozambique borders through informal trade.
- In 2016/17 prices of pigeon pea plummeted (from a high of Mk 1,000/kg (>\$1) in some markets to as low as ~Mk 100/kg in some markets in 2018. This is partly due to a ban on imports into India. Despite this, pigeon pea hectareage is estimated to decrease by only 9.2% and production by 10.8% in 2017/18 season.
- To strengthen the pigeon pea value chain, Malawi needs to invest in the seed and extension systems, strengthen farmer organizations, secure the India market through diplomacy, diversify the export market and create demand within the country.

Importance of Pigeon Pea in Malawi

Literature review and secondary data analysis revealed that pigeon pea can be an important crop for Malawi in that: it is well adapted in the semi-arid tropics; is highly drought tolerant (compared to maize, tobacco and cotton); can contribute to soil fertility through biological nitrogen fixation as well as from the leaf fall and recycling of the nutrients (Snapp et al. 2002 and 2003; Mhango et al. 2012); its production is relatively less resource intensive; its grain has a high protein content compared to maize (Simtowe et al. 2010); and it accounts for approximately 20% of household income among farmers in the Southern region of Malawi (Orr et al. 2000). Malawi is the leading producer of pigeon pea in Africa, and the growth in production has generally been growing, reaching more than 450,000 tons in 2016/17 season, until recently when production has declined by 10.8% (Figure 1).

Figure 1: Pigeon pea production in Malawi by ADD



Source: MoAIWD Agricultural Productions Estimates Survey (APES)

Note: 2018 data is from 2nd round estimates while the rest of the figures are from 3rd round (final) estimates. Blantyre, Machinga and Shire Valley are in the Southern region of Malawi; Lilongwe, Kasungu and Salima in the Central; and Karonga and Mzuzu in the Northern region.

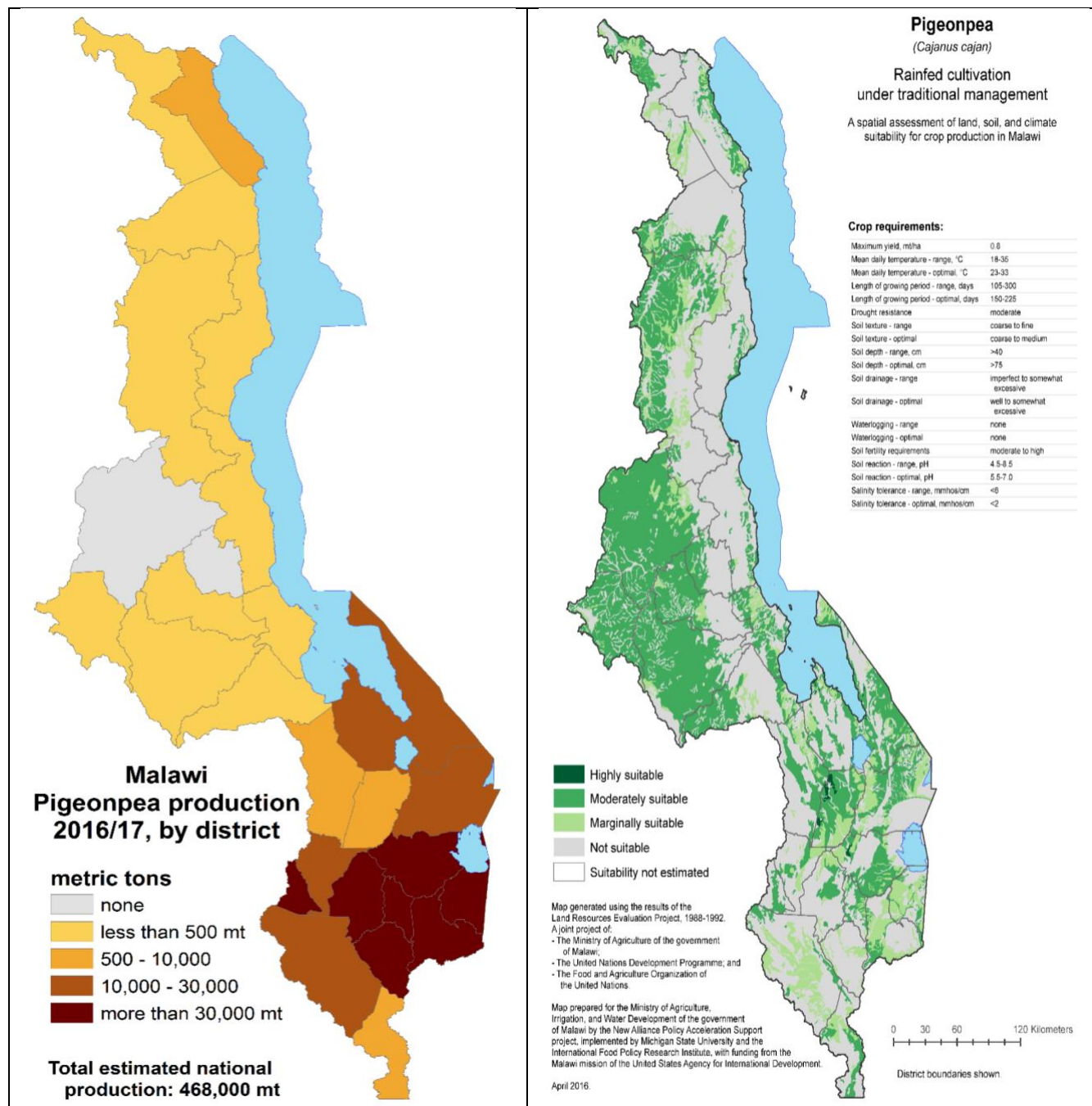
The data shows that pigeon pea is the most important legume crop accounting for 35% of total tonnage of legume production in Malawi, followed by groundnuts (29%), soya beans (16%), common beans (15%), cow peas (4%), velvet beans (1%), and ground beans (1%) (MoAIWD APES 2016/17). In terms of area under cultivation occupied by the crop, pigeon pea is the third most important legume, occupying 21% of land that is committed to legume production, while groundnuts occupy 29%, common beans 25%, soya beans 14%, cowpeas 8%, ground beans 1% and velvet beans 1%. Pigeon pea is mostly grown in the Southern region of Malawi while crop suitability maps show that it can be grown in any region of the country particularly the Central region (Figure 2).

Pigeon Pea Production in Malawi and Competing Countries

In terms of share in global pigeon pea production, Malawi has been facing stiff competition from Myanmar and her neighbors, Tanzania, Uganda, Kenya and Mozambique. India is the largest producer of pigeon peas. In the period 2005-2014, India alone accounted for over 60% of global pigeon pea production, while Myanmar in second place contributed between 12% and 19% of the global pigeon pea production (FAOSTAT, 2017; see also Figure 3).

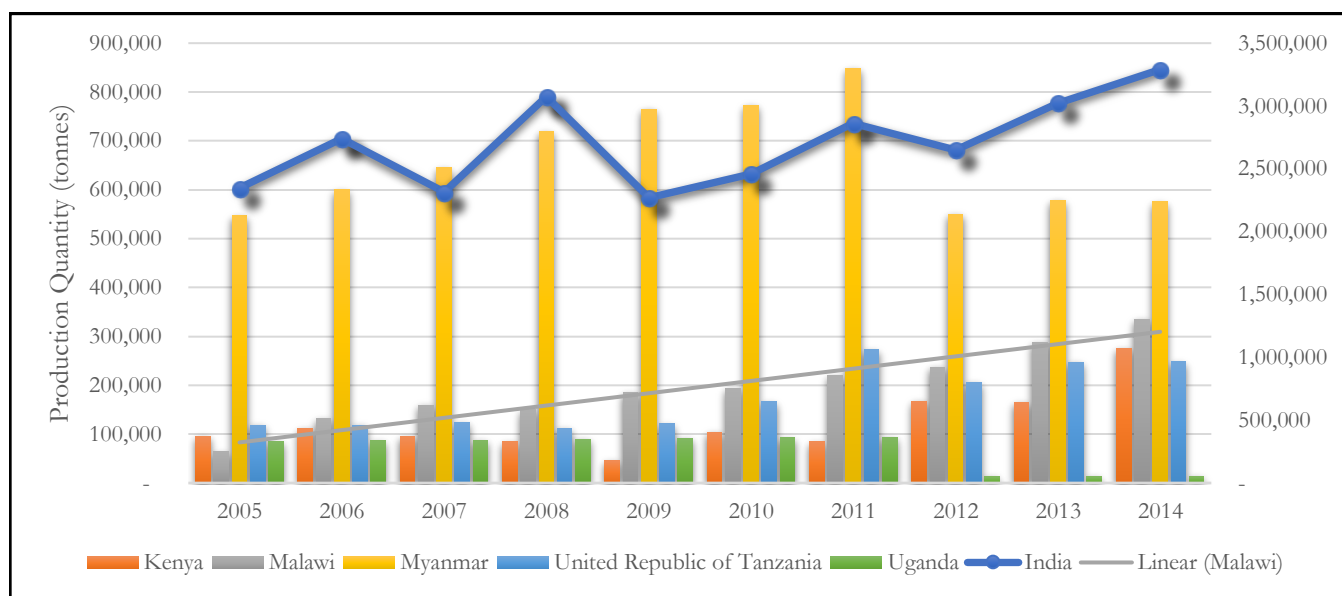
Relative to her competitors, Malawi has experienced a more favorable trend in crop yield (Figure 4). Between 2004 and 2017 yields have increased for Malawi from 400 kg/ha to 1712 kg/ha. This is mostly due to increased availability of new high yielding and early maturing varieties that have been developed and distributed to farmers in Malawi at subsidized rates since 2009, through the Farm Input Subsidy Program and several projects.

Figure 2: Estimated pigeon pea production in Malawi (left) by district, 2016/17 cropping season, metric tons versus suitability map (right) for pigeon pea grown under traditional management in Malawi



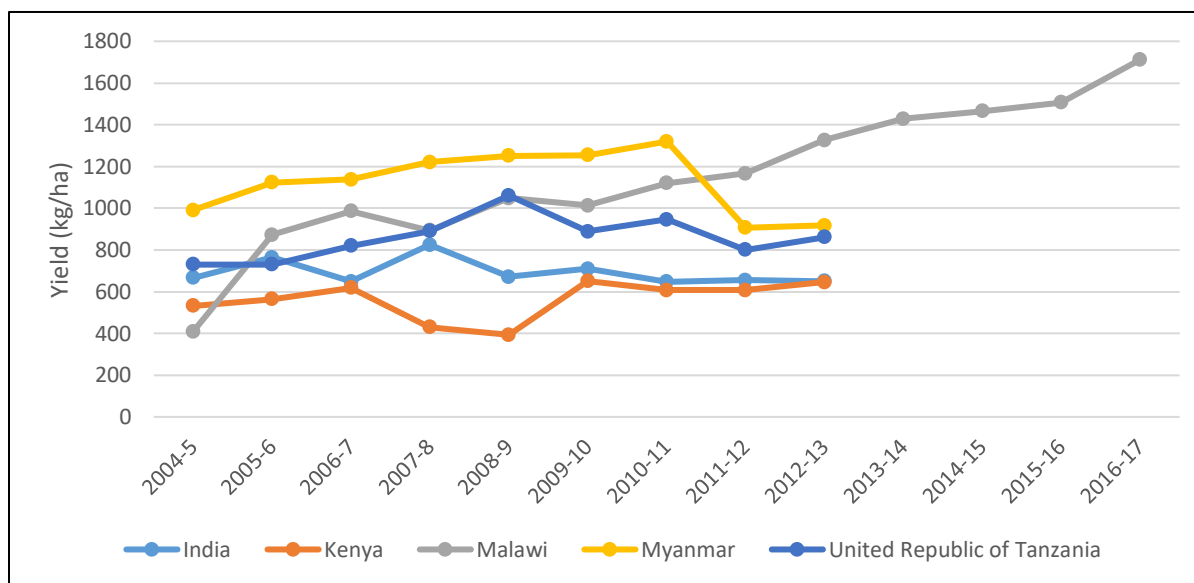
Sources: Malawi APES data, Department of Land Resource Conservation data and Todd et al. 2016

Figure 3: Pigeon pea production (tons) in Malawi and some of the competing countries: 2005-2014



Source: Authors' computation using FAOSTAT (2017) data

Figure 4: Trend in pigeon pea yield in Malawi compared to competitors: 2005-2017



Source: Authors' compilation using FAOSTAT, 2017 data for 2004-5 to 2012-13; Malawi's data for 2014-2017 is from MoAIWD APES). APES data and FAOSTAT data from 2004-5 to 2012-3 is similar for Malawi.

Despite this positive trend, most farmers do not grow improved varieties of pigeon peas and few use chemicals to control pests and diseases due to low purchasing power. The survey administered to farmers during this study collected data on the specific pigeon pea varieties

cultivated by the farmers. Table 1 shows that the three top most cultivated varieties are Namanjo, Mwayiwathu alimi (ICEAP 00557), and Mthawajuni. However, only Mwayiwathu alimi is an improved variety. Limited adoption of improved seed varieties is influenced by many

factors including low pigeon pea prices faced by farmers that dis-incentivize farmers from purchasing necessary inputs (Mula and Saxena (2010); Simtowe et al. (2010); ACB (2016); Me-Nsope and Larkins (2016)). However, most farmers interviewed (62%) indicated that they selected varieties that were early maturing e.g. Mwayiwathu alimi (ICEAP 00557) and better adapted to climate change (drought resistant). Most (60 %) also indicated that yield potential (high yield) is an important factor that influence their choice of growing a particular variety. Considerations of market access, prices and consumer demands were not as important in the choice of varieties to grow: 14.3% mentioned access to market as a factor, 14% mentioned varieties preferred for consumption (customer demand) and only 6% mentioned that they consider varieties that fetch higher prices. The data also revealed that good taste/aroma and suitability for processing into flour were the most important attributes sought for in the varieties that farmers chose to eat or cultivate for their own consumption. The data also suggest that the quality of the grain was an important attribute sought for in varieties cultivated for commercialization. However, for most farmers (68%), the variety cultivated for consumption is not different from the variety cultivated for sell. When asked about the source of their seeds, most farmers mentioned recycled seed (44%) followed by agro-dealers (30%), government extension workers (11.7%), other farmers/farmer groups (10.4%), vendors (10.4%), ICRIAT (9.5%), and NGO's (9.1%).

Table 1: Common pigeon pea varieties cultivated by smallholder farmers in Malawi

Variety Name	Frequency	Percent
Namanjo	77	33.3
Mwayiwathu alimi	76	32.9
Mthawajuni	38	16.4
Local	26	11.3
Loti	17	7.3
Mthawamanja	11	4.8
Makolo	9	3.9
Other	73	39.6

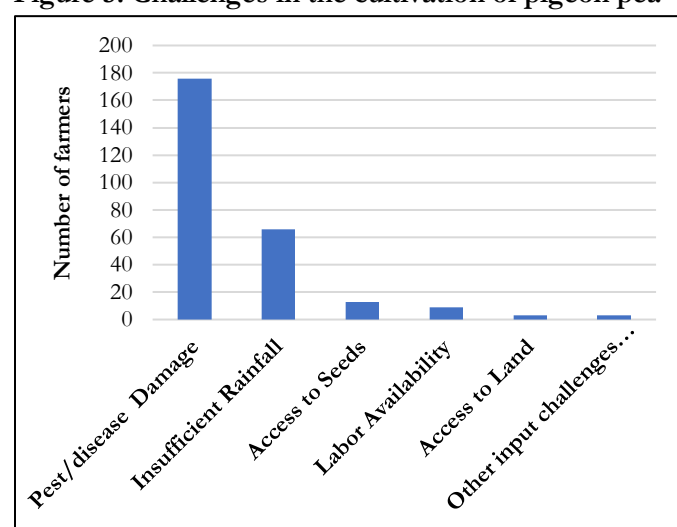
Source: Authors' computation from NAPAS:Malawi survey data

Constraints Faced by Farmers and Marketers of Pigeon Pea

Survey data collected from the 231 farmers that informed this value chain study, show that majority of the farmers (81%) are land constrained, cultivating on farms that are 2 acres or less. Increased intensification is therefore critical. When asked about challenges they face, however, most of the farmers mentioned pest/disease damage as a major problem related to cultivation of crops and marketing of

crops (Figures 5 and 6). Insufficient rainfall was also mentioned as a constraint to production, by a large number of farmers. It is however interesting to note that most farmers interviewed did not view access to seed as a problem, indicating that most may not be aware of the positive attributes of improved pigeon pea varieties. It could also be the case that the improved varieties may not be the ones incorporating the good taste/aroma and suitability for processing into flour attributes that farmers are looking for in the varieties they chose to cultivate for their own consumption. These could be found in the recycled seeds or those seeds purchased from other farmers, farmer groups and vendors.

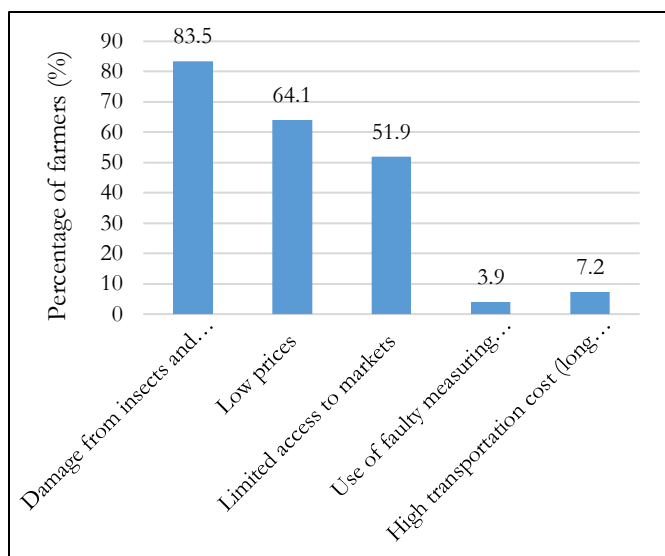
Figure 5: Challenges in the cultivation of pigeon pea



Source: Authors' computation from NAPAS: Malawi value chain survey data

On the marketing side, other challenges include low prices faced by both farmers and vendors and limited access to markets. In fact, few farmers, (4.8% of N=231), acknowledged selling their pigeon pea at the minimum farm gate price announced by government over the radio. The two commodity exchanges in Malawi (ACE and AHCX) also have very thin volumes sold through them. Other constraints include: weak extension; production concentrated in a region that is mostly marginally suitable for pigeon pea production; and high cost of finance.

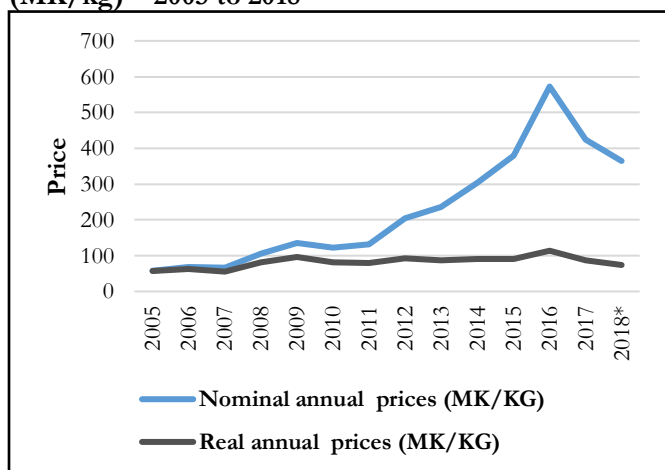
Figure 6: Challenges in the marketing of pigeon pea



Source: Authors' computation from NAPAS: Malawi value chain survey data

India is the biggest importer of pigeon peas. Therefore, Malawi's domestic and export prices are heavily dependent on production in India. For example, due to an import restriction of pigeon peas to India in 2017, Malawi's domestic pigeon pea prices declined significantly in 2017 and 2018 (Figure 7).

Figure 7: Malawi's pigeon pea annual average nominal and real retail prices in local markets (MK/kg) – 2005 to 2018




Source: MoAIWD Agricultural Markets Information System (AMIS). *2018 figure is an estimate based on the average price for the first four months of the year

Price Changes along the Value Chain

Based on information collected from the farmers and pigeon pea retailers, farmers got an average of MK323.76 per kg from selling their crop, while retailers got an average of MK452.56 per kg during the normal season and

MK647.32 per kg during the lean season (Table 2). The gross margin for the farmers that informed this study was 42%. Gross margins were not possible to calculate for retailers, intermediate buyers and exporters/processors.

Table 2. Price changes along the value chain

	Farmer	Retailer	
		Normal season	Lean season
Prices (MK/kg)	323.76	452.56	647.32
Price value change	Base	40%	100%
Farmer-to Retailer			

Source: Authors' computation from NAPAS: Malawi value chain survey data

Impact of Low Prices on Production

Based on second round of 2017/18 production estimates, the low prices for pigeon peas in the 2017 and current period do not seem to have significantly affected number of hectares devoted to the crop, which have declined by 9.2% (from 274,825 ha in 2016/17 to 249,497 ha in 2017/18). The corresponding decrease in volume of pigeon pea expected to be produced in 2017/18 is 10.8%, which is mostly being attributed to dry spells that were observed in the Southern region rather than the price drop. This could be due to:

- 1) A small proportion of pigeon peas that are produced get sold to India. An analysis of Malawi pigeon pea export data for 2014-2016 obtained from <https://www.zaubacom/user> and MoAIWD APES data for the same years, shows that Malawi exported about 12% of the pigeon pea she produced, to India. This means that most of the pigeon pea is produced for domestic consumption and therefore did not get affected much by India's export ban. However, the low prices that were fetched mean that the incomes of farmers that sold their surplus production were greatly decreased.
- 2) Since pigeon pea is a relatively low resource intensive crop, the reduction in incomes did not translate in reduced input usage hence yields did not necessarily decrease. The 2017/18 second round estimates show that pigeon pea yields will be about 1.7 mt/kg, same as they were in 2016/17.
- 3) The price decreases were also experienced by other crops such as maize (due to an export ban being imposed when the country had experienced bumper yields in 2016/17 season). Other crops such as soya and beans also experienced price

decreases due to the bumper harvest in 2016/17. This means that the other crops also did not provide viable alternatives to pigeon peas. For example, maize hectareage is expected to decrease by 23.8% in 2017/18 and soya's by 5.3% while the volumes are expected to decrease by 19.5% and 12.8% for maize and soya, respectively.

- 4) There have been negotiations between the government of Malawi and the government of India that indicate that Malawi will be given a quota to export to India. This will bring the needed stability in the market.

In conclusion, Malawi is not necessarily at the mercy of India when it comes to pigeon pea production. However, India's support to Malawi say through the quota will go a long way in supporting pigeon pea farmers to get a relatively more decent income when they produce a surplus for sale, as the quota may help remove the depression on the market prices.

Recommendations

The crashing of the pigeon pea prices in the Malawi market following several years of rising prices and increasing production and productivity, particularly since 2010, stresses the fact that stable markets are crucial for development of any value chain. In view of this, the most important recommendation coming out of the value chain study is about ensuring a stable export market for the Malawi pigeon pea:

1. A memorandum of understanding should be signed between Malawi and India to ensure access to this important market. New markets also need to be identified and secured.
2. Malawi should invest in strengthening the seed system to increase availability of certified and quality declared pigeon pea seeds and discourage over-recycling of the seeds.
3. The extension system needs to be strengthened and strongly linked to the research system to ensure that more of the improved varieties developed and released are made accessible to farmers.
4. Development of new seed varieties need to take consideration of tastes in India and in new markets that will be identified. It also needs to take consideration of domestic market taste attributes and requirements.
5. ACE and AHCX need to increase their share of pigeon pea marketing and improve their reach to farmers, including provision of price risk management tools.

6. Pigeon pea farmers need to develop strong associations/cooperatives to improve their access to inputs, markets and market information.
7. Local demand for consumption and other uses of pigeon pea should be explored (e.g. for animal feed, firewood, fertilizer trees) to increase local demand for the product.

This brief is a summary of the *Feed the Future Innovation Lab for Food Security Policy Research Paper 98*, "An Analysis of Malawi's Pigeon Pea Value Chain Study" by Nathalie M. Me-Nsope and Flora J. Nankhuni (2018).

Nathalie M. Me-Nsope is Senior Gender Technical Advisor at Food for the Hungry in Washington DC, USA (previously, Assistant Professor, International Development, Department of Agricultural, Food and Resource Economics, Michigan State University).

Flora J. Nankhuni is Associate Professor, International Development, Department of Agricultural, Food and Resource Economics, Michigan State University and Chief of Party, NAPAS: Malawi

References

Me-Nsope, Nathalie and Michelle Larkins. 2016. Gender Analysis of the Pigeon Pea Value Chain: Case Study of Malawi. Center Report Series, No. 8. Global Center for Food Systems Innovation, Michigan State University, East Lansing, Michigan, USA.

Mhango, W. G., Snapp, S. S., & Phiri, G. Y. 2012. Opportunities and constraints to legume diversification for sustainable maize production on smallholder farms in Malawi. *Renewable Agriculture and Food Systems*, 28(03), 234-244.

Mula, MG, and Saxena, KB. 2010. Lifting the Level of Awareness on Pigeon pea – A Global Perspective. ICRISAT, 2010

Simtowe, F., Shiferaw, B., Kassie, M., Abate, T., Silim, S., Siambi, M., Madzonga, O., Muricho, G. and Kananji, G. (2010) Assessment of the current situation and future outlooks for the pigeon pea sub-sector in Malawi. [*Working paper*](#), ICRISAT, Nairobi, Kenya.

Snapp, S.S., Jones, R.B., Minja, E.M., Rusike, J., Silim, S.N. 2003 Pigeon pea for Africa: A versatile vegetable - and more. *Hortscience*, 38 (2003), pp. 1073–1078

Snapp, S.S., Rohrbach, D.D., Simtowe, F., Freeman, H.A. 2002. Sustainable soil management options for Malawi: can smallholder farmers grow more legumes? *Agriculture, Ecosystems and Environment* 91: 159–174.

This research is made possible by the generous support of the American people through the United States Agency for International Development (USAID) under the Feed the Future initiative. The contents are the responsibility of study authors and do not necessarily reflect the views of USAID or the United States Government

Copyright © 2018, Michigan State University, International Food Policy Research Institute, and the University of Pretoria. All rights reserved. This material may be reproduced for personal and not-for-profit use without permission from but with acknowledgement to MSU.

Published by the Department of Agricultural, Food, and Resource Economics, Michigan State University, Justin S. Morrill Hall of Agriculture, 446 West Circle Dr., Room 202, East Lansing, Michigan 48824