SCOPING REPORT

Agricultural Finance Scoping

An Agriculture Finance Scoping Exercise in Malawi

FINMARK TRUST

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ACRONYMS AND ABBREVIATIONS

Acronym	In full
ACE	Agricultural Commodity Exchange
AEZ	Agro-Ecological Zones
AfDB	African Development Bank
AgCom	Agricultural Commercialisation Project
AGPA	Agricultural (General Purposes) Act
AHCX	Auction Holdings Commodity Exchange
AIYAP	Agricultural Infrastructure and Youth in Agribusiness Project
APPSA	Agriculture Productivity Program for Southern Africa
ARAP	Abbreviated Resettlement Plans
ASSMAG	Association of Smallholder Seed Multiplication Action Group
ASWAp	Agriculture Sector Wide Approach
CASA	Commercial Agriculture for Smallholders and Agribusiness
CBD	Cannabidiol
CBFO	Community Based Financial Organisations
CE	Customary Estate
CGIAR	Consultative Group on International Agricultural Research
CLA	Customary Land Act
COMESA	Common Market for Eastern and Southern Africa
CSA	Climate Smart Agriculture
DAES	Department for Agricultural Extension Services
DCD	Department of Crop Development
DFI	Development Finance Institutions
FAO	UN Food and Agriculture Organisation
FARMSE	Financial Access for Rural Markets, Smallholders, and Enterprise Programme
FEWSNET	Famine Early Warning Systems Network
FISP	Farmer Input Subsidy Programme
FtF	USAID Feed the Future
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GED	Global Environment Facility
GIAE	Green Innovation Centre for the Agriculture and Food Sector
GMO	Genetically Modified Organisms
GNI	Gross National Income
GoM	Government of Malawi
ha	Hectare
HV	High Value
IBCF	Incentive-Based Contract Farming
ICRISAT	International Crops Research Institution for the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development

LFC	Leasing and Finance Company of Malawi
MAL	Maximum Allowable Levels
MAPAC	Malawi Programme for Aflatoxin Control
MDTF	Multi-Donor Trust Fund
MFI	Micro-Finance Institutions
MGDS	Malawi Growth and Development Strategy
MICF	Malawi Innovation Challenge Fund
MIERA	KULIMA – More Income and Employment in Rural Areas
MLGRD	Ministry of Local Government and Rural Development
MoAIWD	Ministry of Agriculture, Irrigation, and Water Development
MOITT	Ministry of Industry, Trade and Tourism
MOST	Malawi Oilseed Transformation
MTIP	Malawi Trade and Investment Programme
MWK	Malawian Kwacha
NAIP	National Agricultural Investment Plan
NAP	National Agriculture Policy
NASFAM	National Smallholder Farmers' Association of Malawi
NIP	National Irrigation Policy
NRDS	National Rice Development Strategy
NSTDC	National Smallholder Tea Development Committee
NSTGA	National Smallholder Tea Growers Association
NTM / NTB	Non-Tariff Measures / Non-Tariff Barriers
OAF	One Acre Fund
ODA	Official Development Assistance
PACA	Partnership for Aflatoxin Control in Africa
PHLM	Post-Harvest Loss Management
PRIDE	Programme for Rural Irrigation Development
RMI	Rocky Mountain Institute
RUTF	Ready to Use Therapeutic Foods
SACCO	Savings and Credit Cooperatives
SADC	Southern African Development Community
SAP	Structural Adjustment Programme
SAPP	Sustainable Agricultural Productivity Program
SCA	Special Crops Act
SFFRFM	Smallholder Farmers Fertiliser Revolving Fund of Malawi
SIVAP	Smallholder Irrigation and Value Addition Project
SME/SMME	Small, Micro, and Medium Enterprises
SOYAMA	Soybean Association of Malawi
SSA	Sub-Saharan Africa
SVTP	Shire Valley Transformation Programme
TRADE	Transforming Agriculture through Diversification and Entrepreneurship Programme
UNDP	United Nations Development Programme
VCR	Value to Cost Ratio

1. MALAWI COUNTRY OVERVIEW

Situated in south-eastern Africa, Malawi is a landlocked country spanning 118,484 km2 with a population of roughly 19 million people. This figure is expected to double by 2038.[1] Despite recent improvements in human capital and average life expectancy, Malawi faces notable poverty; it is often ranked among the world's poorest countries with a gross national income (GNI) of roughly $380 per capita and over 70% of the population living in poverty.[2, 3]

Politically, Malawi has experienced a stable and peaceful government since independence in 1964. Multi-party presidential and parliamentary elections have been conducted every five years following the end of a one-party rule in 1993.[4] Regionally, Malawi is a member state of the Southern African Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA). Despite membership, the Africa regional integration index[5] indicates that Malawi's regional integration is poor, ranking eleventh in both the SADC and COMESA communities.[6]

In its economic history, Malawi has experienced periods of positive performance, largely corresponding to periods of positive agricultural productivity, but growth has generally been too slow to reduce poverty in a meaningful way; from 1961 to 2018, annual growth averaged 4.3%. The first fifteen years following independence in 1964 saw higher and consistent growth rates averaging 6.2% per year, but these gains were halted by events including the global oil crisis and spike in oil prices of 1979; the Mozambican civil war of 1977-1992 restricting access to the Nacala Sea Port; falling tobacco prices; and periods of failure for rain-fed agriculture. Through the 1980s, Malawi saw an annual average growth of only 1.7%.

More recently, from 2006 through 2010, the country experienced an elevated average economic growth rate of 7.4%, and real Gross Domestic product (GDP) growth of 4.2%, following well-implemented strategies including the Farm Input Subsidy Programme (FISP), improved economic management and fiscal policy, and suitable weather patterns. However, from 2010 to 2017, average growth fell to 3.8% as policy failed to keep up with population growth, and climate shocks worsened.[7] Despite this fall, 2019 resulted in economic growth of 4.4% (from 3.5% in 2018) with renewed success in agricultural production, including increases in maize and other cash crops excluding tobacco.[8] This growth brought Malawi's GDP to $7.7B, nearly rebounding to its record high of $8B in 2011. As for 2020 and into 2021, experts note that the full extent of COVID-19 on the economy of Malawi remains unknown. Certainly, Malawi's three-year pathway of rapid growth has been disrupted; global supply chains were interrupted and imports fell by 26% in April and May (2020) alone, preventing farmers from accessing high quality inputs.[9] Prior to the onset of Covid-19, growth was projected to rise modestly to 5.2% in 2020 and 5.5% in 2021, supported by prudent policies, improved external financing, favourable terms of trade, and continued investments in infrastructure for major trade corridors.[10]

For 2019, revenue and grants accounted for 10.3% of GDP, falling below the target of 12.2%. In the same year, total public expenditures and net lending fell roughly one percent below the target of 14% of GDP, attributed to underspending on monies allocated to development. Despite restrained spending, consistently high fiscal deficits have led to domestic debt valued at 29.7% of 2019 GDP, an increase from its 28.2% in 2018.[11]

The agricultural sector in Malawi has great bearing on the overall economy and the aforementioned indicators, constituting over 30% of the GDP, employing around 80% of the total workforce, and contributing about 75% to foreign exchange earnings.[12] As many as 5,650,000 hectares (ha) of land are used for farming, representing over 60% of the country's

With the understating that the agricultural sector is very dynamic with constant opportunities and threats rising from different angles from time to time, FinMark Trust conducted an agriculture scoping study to identify areas for intervention related to agriculture finance in supporting agricultural value chain activities. The aforementioned scoping study was undertaken in the following SADC countries, namely Botswana, Eswatini, Lesotho and Malawi.

This study identified areas for targeted intervention in agricultural finance, with focus on:

- *Identifying and mapping key value chains, understanding blockages especially access to finance,*
- *Improving agricultural productivity and employment,*
- *Improving incomes and welfare for vulnerable groups (including women and youth), and*
- *Leveraging on technological innovation in relation to clean energy.*

total land.[13] Between 2005 and 2011, over 80% of the country's total exports were agricultural products, primarily tobacco, sugar and tea. Tobacco alone represents on average 60% of Malawi´s total exports.[14]

Malawi's agricultural sector can be divided into two sub-sectors: smallholder farmers, and estates. The smallholder sub-sector is the main producer of food crops, whilst the estate sub-sector contributes greatly to forex earnings. Smallholders play an important role in Malawi's agricultural sector, with 80 % of Malawians, or 4.2 million farming families, operating smallholder farming endeavours and more than 70% of agricultural GDP coming from smallholders.[15, 16] Although the estate sub-sector focuses primarily on the commercial production of high-value (HV) cash crops such as tobacco, tea, sugarcane, and macadamia, an important proportion of smallholder farmers are also involved in the production of cash crops, namely tobacco and tea.

Recently, medium-scale farmers, defined as farmers cultivating between 5 and 50[17] hectares of land, have been gaining a growing share of the agricultural landscape.[18] Many of these medium-scale farmers are urban-dwelling, working class, or elite rural individuals who often operate farms without themselves being involved in crop cultivation; larger medium-scale farm owners (often in the 20 to 50 ha range) have created production livelihoods based on pluri-activity and multiple income sources, where the farmer is non-farm based and often acquires the means for production and financing farming with non-farm funds. The smaller medium-scale farmers (5–20 ha) are also seen to engage in non-farm activities as a necessity to diversify their income, but more frequently do so while still operating their farms.

The makeup of labour on these medium-scale farms is also telling: a 2014 survey of 300 farms in Malawi indicated that farms with 5-10 ha (the smallest of medium-scale holders) had an average of 4 family laborers and 2 non-family full time laborers, as well as 10 non-family temporary seasonal laborers, indicating that the farm-operating family does much of the cultivation labour. Larger medium-scale holders of 40-50 ha had converse averages of 2 family laborers and 4 non-family full time laborers, as well as a remarkably higher average of 73 non-family temporary seasonal laborers. These labour divisions can all be compared against smallholders' averages of 4 family laborers, zero non-family laborers, and 10 non-family temporary seasonal laborers to understand that medium-scale farmers can afford to hire additional labour and oversee production from afarwhile participating in other employment.[19]

Smallholder farmers are typically defined as those who cultivate small and fragmented land holdings of less than one hectare (on average 0.61 ha) and produce lower crop yields than those in the estate subsector. 76% of farmers in Malawi farm on less than one hectare and around 30% of farmers farm on less than half a hectare of land. The land size has negative implications for smallholder farmer productivity and yields.[20]

Malawi is experiencing a rapid rise in the youth population, with over 60% of the population being between ages 15 and 24. There are insufficient employment opportunities in the country to absorb the employment needs of the youth population. 56% of rural Malawian youth (aged 15-24) are consistently engaged in farming, and the average age of a person who works in agriculture as own-farm labour in Malawi is 31.[21] There is a moderate degree of stability in farming among youth i.e., sustained youth involvement in the agri-food system or re-entry into the sector; however, it has been noted that this could be because of lack other employment opportunities or poor economic prospects beyond the sector.

1.1. Environmental and Natural Resource Base

Malawi's economy is heavily tied to its natural resource base and economic wellbeing – as much as 43% of the country's wealth is derived from renewable natural capital. Cropland is Malawi's most wealth-producing renewable natural capital, but pasturelands, timber from forests, non-

timber forest products, watershed services, and protected areas are also encompassed by this estimation of wealth.[22]

Although Malawi has over 3 million hectares of cultivatable agricultural cropland, more than 99% of this agricultural land remains under rain-fed cultivation lacking advanced irrigation systems. The country's overdependence on rain-fed agriculture leaves it vulnerable to climate related shocks which lead to suboptimal crop yields and the danger of total failure of crops. For instance, between the years of 2011 and 2013, Malawi experienced low agricultural production due to unreliable rainfall patterns resulting in droughts and floods, pests and diseases, and unreliable temperatures. With an agro-based economy and over 80% of export earnings derived from agricultural outputs, the 2011-2013 climatic shocks slowed economic growth and led to a notable downturn in development.[23]

Furthermore, the rapid rate at which wooded areas have been destroyed in Malawi has been of great concern in recent times. Deforestation is estimated to be responsible for the loss of 33,000 hectares per year in the country, making it the highest deforestation rate in the SADC. In addition to forests, fish stocks and biodiversity are also decreasing due to overharvesting and illegal trade and amplified by weak governance. Household environments are made less safe by excessive air pollution and lack of tools to properly dispose of solid and liquid waste. Reference Section on Clean Energy for further discussion of these changes and their environmental consequences.

2. AGRICULTURAL OVERVIEW

2.1. State of Production

Despite representing a large portion of the economy, agricultural productivity in the country is poor; the country's agricultural output per worker is one of the lowest globally. Poor and degraded soils resulting from continuous cultivation, despite having higher intensity use of fertiliser as compared to other Sub-Saharan African (SSA) countries, are one driving factor behind low output. Allowing croplands to rest between cultivation is a viable strategy to repairing degraded soil, but this would reduce productivity for an already food-insecure country and is therefore not always a sustainable option. Alternative practices for preventing the degradation of soils include avoiding mono-cropping and operating with minimum tilling. A politically tempting, yet ultimately impractical, solution is to provide more subsidy for fertilisers. In addition to lower crop outputs from farms, a limited industrial base and weak linkages between sectors also constrict downstream agricultural activities, contributing to low productivity.

Although productivity is low, several crops are grown in nearly every region of the country by both smallholders and estates.

Although productivity is low, several crops are grown in nearly every region of the country by both smallholders and estates. These crops can be understood in two categories: staple crops, which are primarily consumed within the country contributing to nutrition and subsistence, and cash crops, which are exported for foreign revenues.

2.1.1. Staple Crops

The top staple food crop in Malawi is maize, with cassava following as the second most important across the country, and the leading staple crop for the lake shore districts.[24, 25] Most maize and cassava yields are used for individual household consumption and do not reach the market. Rice, sweet potatoes, Irish potatoes, and legumes are also common staple crops, grown primarily for household consumption (subsistence) or sale within Malawi.[26] As climate change poses new threats to agriculture, drought-tolerant root crops such as sweet potato and cassava have become increasingly practical as compared to maize.[27]

Groundnuts were once one of Malawi's traditional export crops and were mainly farmed and produced by women smallholder farmers, but this market collapsed in the 1980s. Although international demand has fallen, groundnut remains an important legume produced in Malawi, mainly by smallholder farmers (for both regional and domestic supply as well as farmer consumption). Groundnut is considered valuable for improving food security as it provides additional nutrients beyond a typically maize-based Malawian diet. Although not widely exported, groundnut remains an economically valuable product as 40% of production is marketed.

2.1.2. Cash Crops

Unlike many other SSA countries, Malawian smallholders hold a large share of the cash crop industry. Zant (2020) explains "it is by historical coincidence and unlike most developing countries that smallholders in Malawi – and nearly exclusively smallholders, the poorest part of the population – are involved in cash crop cultivation for export."[28]

Malawi's top cash crops exported in 2018 were: raw tobacco ($694M in sales), tea ($89.8M), other nuts ($32.8M), raw sugar ($32.6M), and soybean meal ($22M).[29] Other relevant value chains include rice, aquaculture, paprika and chilies, spices (garlic and ginger), coffee, and livestock. Although not yet produced in Malawi, hemp/cannabis has significant potential to contribute to Malawi's agricultural economy and the viability of this value chain is currently being investigated.

Tobacco: Tobacco is Malawi's most significant high value cash crop, and is farmed in nearly every one of Malawi's 28 districts. Following independence in the 1960s, tobacco was predominantly produced by large estates, until 1992 when the World Bank-led Structural Adjustment Program (SAP) opened the market to smallholder farmers. As smallholders were integrated into the value chain, smallholder production of burley tobacco shot up from 10,000 metric tons (1994) to over 80,000 tons (1997- 2 1999). International companies known as tobacco leaf companies have remained in control of the processing and export of tobacco.[30] By government regulation, tobacco can only be sold on auction floors.[31] Prior to 2004, three tobacco auction floors existed: Limbe, Kanengo, and Mzuzu. The fourth, Chinkhoma auction, was established in Kasungu district in 2004, creating a practical means for farmers in its vicinity to produce tobacco for commercial export.[32]

It is widely agreed that tobacco is Malawi's most profitable crop. It is also largely acknowledged that an overdependence on the crop makes Malawi particularly vulnerable to shocks in international prices, markets, and demand, and to any potential crop disease that could impact productivity within the country or even within a smaller region. Tobacco also presents certain risks as it is marketed only from March to September in Malawi, and any yield that cannot be sold during that timeframe is very difficult to store without losses in quality. While staple crops can still provide valuable nutrition to farming communities if it is unable to be marketed, tobacco does not carry this benefit. Furthermore, tobacco prices are heavily determined by quality. One strategy that has emerged to take advantage of otherwise missing markets is contract farming. A contract farming arrangement provides farmers with access to credit using the contract as bank collateral. Access to credit can give farmers the opportunity to improve both productivity and quality, leading to higher prices and income. However, many farmers do not realise meaningful improvements in income or welfare as they have little bargaining power in the contractual relationships, leading some to criticise contract farming agreements for taking advantage of the smallholders.[33] The need for contract farming has been increasingly discussed by the Government of Malawi as tobacco prices have fallen over the last 15 years.

Even with arrangements like contract farming, it is unwise for farmers to rely exclusively on monocropping tobacco. As such, the strategy of diversifying the makeup of crops produced at the national level and for individual farming households is key. Many farmers automatically diversify their crops by also cultivating staple crops for their own consumption (such as maize, beans, etc). Agro-diversification initiatives take systematic approaches to diversifying cash crops and increasing the production of crops other than crops for export.

A 2020 study uncovered four structural barriers individual smallholders faced to diversifying away from tobacco: perceived economic importance, lack of alternatives, vested industry interests, and the polarised conflict between tobacco control advocates and farmers.[34]

In addition to preserving the economic wellbeing of the industry and farmers, international actors in public health have encouraged diversification of crops and lobbied to lessen the production of tobacco due to the adverse health effects of smoking tobacco.[35]

Tea: Malawi has favourable conditions for tea crop production. In 2017, Malawi ranked 16th in terms of total tea output globally, and ranked 4th within the African continent, after Kenya, Uganda, and Burundi.[36] Tea production in Malawi has been steadily increasing over time from ~14,000 tonnes in 1961 to ~47,000 tonnes in 2019. Despite this significant increase in production levels, production in the past decade has stagnated, oscillating between 42,000 and 52,000 tonnes annually. Based on the FAO World Tea Model, total output in Malawi is projected to grow at a rate of 0.6% annually. The tea industry is the largest formal sector employer in Malawi, employing over 50,000 workers (permanent and seasonal) and provides livelihoods for between 14,000 and 170,000 smallholder farmers. [37, 38]

The tea industry has been identified as one of the top five value chains in the country for creating employment and reducing poverty. However, there exist numerous challenges to the growth of the industry, including the oversupply of black tea at the global level which puts

downward pressure on real tea prices in Malawi. Estates are also limited by old plantations that are low yielding and the recognition that the land can be used for more profitable crop substitutes such as macadamia. Land tenure security for smallholder growers is also problematic and this is exacerbated by a decrease in the size of landholdings devoted to subsistence farming (a result of several factors including population growth and deforestation). Tea is also exclusively produced in the southern region of the country which limits expansion of production.

Tea production in is divided into two systems: 1) production by well-established commercial estates, characterised by the usage of high-quality inputs, relatively high yields, and modern processing facilities, and 2) smallholder farmer production, involving low inputs, less advanced farming practices, relatively low yields and a lack of processing facilities. Smallholders produce green leaf tea and sell their product directly to estates, which process the unfinished green leaf tea into 'made tea' and market it for domestic consumption or export. Although well-established commercial estates tend to dominate production, it is estimated that there are about 17,000 active smallholder farmers in Malawi. In 2017, the smallholder sector accounted for 7% of volume of tea produced. With such low production and estates being their only linkage to international markets, smallholders have very little negotiating power in the arrangement. Farmers' organisations such as The National Smallholder Tea Development Committee (NSTDC) and National Smallholder Tea Growers Association (NSTGA) have been established with the mandates of acting as collective voices for smallholder farmers, but they have seen little success in gaining more negotiation power.

Macadamia: Macadamia is another relevant, profitable cash crop for Malawi. In 2016, Malawi accounted for 3% of global macadamia nut production and 5% of total exports. A 2018 USAID and Michigan University study concluded that Malawi was well positioned to increase its global market share if the country found new ways for smallholder farmers to access finance and better integrated smallholder farmers into the macadamia value chain through private and public partnerships. The study also notes that there are large tracts of land in the Central and Northern regions of the country that are suitable for macadamia production. [39]

Sugar: Raw sugar constitutes around 10% of Malawi's GDP and 35% of the agricultural sector. Over 11,500 workers are directly employed by the industry, including seasonal and non-permanent workers. Based on average household sizes, the sugar industry supports the livelihoods of as many as 130,000 people including dependents.[40] Four varieties of sugar are produced: cane sugar, refined sugar, sugar syrup, and specialty sugar for export. Sugar production is dominated by one company, Illovo Sugar, which operates multiple estates and two mills. Most or all outgrower farms growing sugar in Malawi supply their yields to Illovo as it operates the only two sugar mills in the country.[41] The sugar industry has led to land conflict in recent years, with accusations of land grabbing made against Illovo and its larger outgrowers. Critics including the Competition and Fair Trading Commission (CFTC) have questioned the monopoly Illovo holds over sugar as it is reinforced by a Government ban on importation of sugar.[42]

Soybean: Soybean is an important crop, particularly for smallholders, as it has benefits in improving household nutrition and food security, enhancing rural incomes, and also counteracting soil degradation by contributing to the nitrogen economy of the soil.[43] Soybean fixes on average approximately 50–60% of its nitrogen, which effectively aids in the fertilisation of the soil and surrounding crops.[44] Soybean is well adapted for production in all agro-ecological zones of Malawi, and there are eight soybean varieties currently registered for commercial production in Malawi.[45] The soybean VC shows great potential for expansion and improved productivity: a 2016 study found that low-cost techniques including the use of inoculants, compost manure and increased plant populations had significant impacts on profitability and yields. Inoculation and increased plant population as a combined intervention resulted in an average value to cost ratio (VCR) > 2.[46]

Smallholder soybean farmers sell their crops directly to buyers at local markets, as well as to companies, NGOs, and middlemen traders. A 2015 survey of soybean value chain participants showed that the majority of farmers (85.2%) sold their produce to traders and only 29.6% sold directly to consumers at government markets. The surveyed traders accomplished extremely high, 'supernormal' profit margins while smallholder farmers' profits were much lower.[47]

Middlemen traders have great influence on the price of soybeans. Price setting is done by individual traders rather than by any government body or regulating authority. The same 2015 survey showed that soybean price determination was dependent demand (58.2%), transport costs (56.7%), quality (26.9%) and purchase price (20.9%). With middlemen traders setting prices, smallholder farmers hold very little bargaining power in the market.

Rice:[48] Malawi's rice crop is largely produced by smallholder subsistence farmers, often as a secondary crop to maize. It serves as both a food for household consumption and a cash crop. In some cases, groups of farmers collaborate as an association to grow rice for commercial sale. Roughly 85% of rice fields are rain fed, and only 15% are irrigated. Most regions of Malawi are suitable for rice growing, but production is mostly concentrated along the western shore of Lake Malawi, in proximity to Lake Chilwa, and along the Lower Shire River as well as in the Northern part of Malawi. Rice is also grown along the shores of the smaller rivers flowing eastwards into Lake Malawi. The African Institute of Corporate Citizenship (AICC) estimates that 300,000 farmers were involved in the production of rice as of 2016, across a total of 60,000 hectares of land.

Aquaculture: Fish is the most affordable and main source of animal protein for many Malawians. Of Malawi's 118,500 km2 of land, 20% is water and roughly 10–25 percent of the total land area, or 11,650 km2, is suitable for aquaculture. Lake Malawi has a surface area of 29,500 km² and a 700km shoreline in Malawi, and serves as the country's main source (85-90% of total domestic fish production) of fish resources. Over 4,050 fish farmers operate 9,500 fishponds and produce an estimated annual total of 800 tonnes of fish. The annual output is made up of approximately 93%, 5% catfish and 2% exotic species.[49] In terms of demand, the average per capita consumption per year across Africa is 8.3 kilograms, which is lower than the world average of 18.9 kilograms and the recommended World Health Organisation level of 17 kilograms. Malawi's per capita consumption has fallen by more than 60% from 1970 to 2015 (falling from 14kg/person to 8kg/person) due to decreased fish supply and rapid population growth.[50] From 2000 to 2010, annual output averaged approximately 70,000 metric tonnes; however, the total potential of fisheries in Malawi has been estimated at roughly 100,000 tonnes, in part due to previously untouched deep water fish resources, representing room for growth.[51]

Fish is a very valuable food commodities for trade within the country and can be marketed in several forms; of the total fish landed, 25% is marketed fresh, the other 75% processed by smoking, frying, parboiling, or sun-drying. A fisherman will determine how to market caught fish based on the size and species of fish, as well as available infrastructure and the distance to markets.

Based on aquaculture's value for nutrition and domestic trade, attention and capital have been committed towards reviving the aquaculture industry in recent years; in 2019, the African Development Bank (AfDB) approved USD 13.2M in loans and grants to bolster sustainable capture fisheries, aquaculture development, and to strengthen the country's fish value chains.[52]

Paprika and chillies:[53] A 2010 value chain analysis for paprika and chillies found that the two crops were mainly produced by smallholders and sold to large-scale traders, many of whom were also exporters of the two goods. Smallholder farmers allocated relatively less land to paprika production in the 2009-2010 season being studied, using 18% of land for paprika as compared to 40% of land for bird's eye chillies. Although smallholders dominate production, some commercial producers are also involved, and some of those commercial producers also

utilise out-grower arrangements. In terms of production, many of the farmers of both paprika and chillies access their seeds through market-based sources. The same study identified several challenges to the growth of the industry, including access to market information and access to information on pricing. Profit margins for bird's eye chillies were found to be noticeably higher than those of paprika. Despite challenges, paprika offers great potential for value addition as it can be intercropped with maize and grown in similar conditions to tobacco, making it a possible cash crop alternative.

Spices: The unavailability of improved seeds for most spices is a restricting factor in the production of spices, yet some are still grown. Garlic is grown in at least four areas of Malawi, namely Ntcheu, Dedza, Chikwawa and Thyolo. Strengthening the spice industry for crops such as garlic and ginger has the potential to enhance rural incomes and create new domestic markets, as well as contribute to exports. Cultivating spices such as garlic and ginger is potentially attractive for smallholders, as the skills and inputs already known to them are transferable to spices.

Coffee: Coffee has a history of production in Malawi and several variations grow in certain agro-ecological areas of the country. Although input costs (including chemicals, irrigation, and fertiliser) tend to be costly and the crop requires significant management, coffee has allowed farmers to diversify their income and is highly compatible with other important agricultural crops in Malawi. Green coffee beans produced in Malawi are mainly sold unrefined to the international market, largely to the United States and Europe. A very small volume of Malawian coffee is consumed by the domestic market. Over 3,200 smallholders are involved with the industry, predominantly in Northern Malawi. These smallholders tend to average smaller yields than the estates operated in the south, but both produce high quality coffee sold into international markets.[54]

A 2014 survey of 300 farmers across three districts of Malawi uncovered that the total area of land acquired by medium-scale farmers had almost doubled between 2000 and 2015

Hemp/cannabis: Hemp is seen as a viable crop for diversification away from tobacco, in part because the infrastructure and knowledge Malawian farmers currently use in the tobacco industry is transferable to the cultivation, harvesting, and processing of industrial hemp crops. All parts of the plant, including the seeds, leaves, flowers and stalks, can be used.[55] The crop can yield many diverse finished products including: hemp seeds for consumption, which are dense in the omega-6 fatty acid known as GLA, as well as all 10 amino acids; hemp biodiesel; plastic composites; clothing; non-toxic, carbon dioxide-trapping building materials for roofing, flooring, bricks, or insulation; traditionally wood-based products such as paper or tissues; CBD, a cannabinoid which has analgesic, anti-inflammatory and anti-anxiolytic effects when processed into an oil.[56] Until recently, the production of hemp was not legal in Malawi; however, a 2015 bill was passed to study the potential of industrial hemp as an alternative cash, and cultivation of the crop became legal in 2020.

Livestock: Livestock plays a significant role in Malawi's economy, with around two thirds of all rural households raising cattle, goats, sheep, swine and/or chicken for food and income generation. Livestock can also be complementary to other labour-intensive crops, and the use of work animals can increase productivity for staple and cash crops alike. While livestock have a positive impact on household income, food security, and national GDP, it is also a major source of climate-harming emissions; in 2017, livestock alone were responsible for 24% of country's total estimated greenhouse gas emissions.[57] As Malawi's population grows in the coming years, livestock numbers are anticipated to rise, which will in turn increase greenhouse gas emissions.

2.2. Land Tenure and Access

Tenure security in Malawi is categorised as a customary residence system of landholding. As much as 69% of the Malawian population's rights to access, use, and own land is determined by these customary residence systems, and according to estimations by the FAO customary land accounts for 70 to 80% of the country's total land.[58, 59] Malawi has both matrilineal and

patrilineal customary residence systems; the former is widely practiced in the southern and central parts of the country where smallholders and estates primarily produce tea, and the latter in the northern regions.[60]

In 2016, the Government of Malawi released a Customary Land Act (CLA) allowing smallholder farmers to transform their customary land rights into private land rights with registered titles, to be known as Customary Estates (CEs). Organisations and institutions, such as churches or universities, can also create CEs for their land. The process is entirely voluntary for both individual smallholders and institutions. Once converted, these CEs have no specified duration, are inheritable and can be transferred by will. The CLA aims to provide more tenure security for land holders, hoping that this security will incentivise landowners to invest in improving the productivity of the land. These incentives are particularly high for poor smallholders who may not otherwise see investment as worthwhile based on insecurity and potential to be displaced from land.

This reform will also provide an avenue for the monitoring of land insecurity and arising conflicts which will prove particularly relevant to future investigations on smallholders' ability to consistently access land without fear of eviction or conflict. The CLA is being rolled out in phases, which began with a 3-district pilot prior to 2020, and 6 additional districts piloting in 2020. Comprehensive analysis of the CLA's impact will be possible following these pilots.[61]

Population growth and significantly high population density are causing household farmland availability to decrease, which is particularly challenging given the prevalence of smallholder farmers already operating less than 5 hectares of land

Since available land is a fixed resource, as families grow, their individual share of customary land shrinks. For smallholders who cannot afford to buy additional land, this presents a challenge to expanding their agricultural activities. The Government of Malawi attempted to address this challenge with the National Land Policy implemented in 2002, but shrinking shares of customary land remains an issue.

The rise of medium-scale farmers in a land-scarce country is of note. A 2014 survey of 300 farmers across three districts of Malawi uncovered that the total area of land acquired by medium-scale farmers had almost doubled between 2000 and 2015. Of these medium-scale farmers, just over half reported that they had successfully expanded from being smallholder farmers; a significant number of them were urban-based professionals, civil servants, or entrepreneurs who had acquired land and started farming rather than being born into families which farmed.[62] This pattern indicates that the rise of medium-scale farming is occurring on lands reserved as birth-right of constituents of the traditional authority in a given area. Anseeuw et. Al (2016) posits that "the high proportion of land acquired from formerly utilised customary land raises concerns about the possibility that some medium-scale farmers are forming as part of a process of disenfranchisement of local rural people from land that was traditionally reserved for them".[63]

2.3. Challenges to the Sector

There are numerous challenges hindering the productivity of the agricultural sector in Malawi, including: vulnerability to weather shocks; low adoption of agricultural technologies including low-labour productivity tools; low access to finance and farm inputs; low mechanisation; lack of technical education; poor irrigation systems or under-exploited irrigation opportunities; the poor management of land and soil resources; and weak market linkages and diseases and such as army worm.[64, 65] In an attempt to address these challenges, the Department for Agricultural Extension Services (DAES) of the Ministry of Agriculture, Irrigation, and Water Development (MoAIWD) operates an extension worker program. The implementation of this extension worker strategy has not been without flaws; for example, extension workers do not have standardised practices they can follow and use to ensure productivity and track their own performance. DAES's chosen allocation of funds has also been noted by some third parties as an inhibiting factor in the program's success; in 2011, DAES spent 96% of its budget for extension workers on salaries, leaving very little money for other needs such as implementing other

extension services or providing ongoing technical training for extension workers.[66] Further, an unpredictable policy environment deters investment in the sector. Inadequate infrastructure too hinders the development of the sector by driving up the cost, ease, and efficiency of doing business; the country's Doing Business Ranking (DBR) has not improved in a meaningful way over time. In 2016 Malawi was ranked at 123rd in the DBR on the ease of trading across borders indicator. Other indicators, such as registering property, dealing with construction permits and protecting minority investors also demonstrate a suboptimal environment for investment.[67] A lack of adequate policy has also led to man-made challenges including deforestation, soil loss, the use of ill-suited land for farming, and degradation.

Population growth and significantly high population density are causing household farmland availability to decrease, which is particularly challenging given the prevalence of smallholder farmers already operating less than 5 hectares of land. With such little land, farmers' maximum quantity of crops cultivated is limited by the surface area of the plot. Smallholders, who largely rely on their own yields to provide sustenance and nutrition to their families, are often less likely to allow land to sufficiently rest between harvests, leading to premature degradation of the soil. With limited access to markets and pricing information, and less access to credit to purchase higher quality inputs like fertiliser or irrigation systems, smallholders also face the challenges of lower incomes derived from their small plots. Therefore, small farm size for smallholder farmers remains challenging to output.

A lack of organisation amongst farmers also inhibits productivity of the economy. Of the 4.2 million smallholder farmers in Malawi, a mere 18% belong to any form of collective farmer organisations, largely concentrated in the coffee and tea industries.[68] This lack of collaboration limits farmers' abilities and incentives to become further integrated into the value chain. The negative impacts of this lack of organisation are notable on both domestic and foreign trade. Higher organisation in the future may result in farmers scaling up, negotiating increased prices, and becoming more active in later-stage value chains, increasing profitability.

2.4. Imports and Exports

Malawi's exports are highly concentrated on agricultural outputs; 82% of total exports and 42% of total imports can be attributed to the top ten products, with tobacco, sugar and tea contributing the largest shares. Value chains for these products are filtered through seaports including Dar es Salaam in Tanzania; Nacala and Beira in Mozambique; Durban in South Africa. Roads, both rural and nearer to urban centres, remain critical infrastructure to transport goods for sale. South Africa remains Malawi's most prevalent trade partner, with China and Dubai as other relevant importers of Malawian goods.

Following a rebound in agriculture production, with maize and key crops (aside from tobacco) increasing, Malawi's economy grew by 4.4% in 2019, an increase from its 2018 growth of 3.5%. Despite this recent growth, political uncertainty remains a barrier to business activity and investment.

Following a rebound in agriculture production, with maize and key crops (aside from tobacco) increasing, Malawi's economy grew by 4.4% in 2019, an increase from its 2018 growth of 3.5%. Despite this recent growth, political uncertainty remains a barrier to business activity and investment.[69]

Malawi's major imports include machinery, metals, electrical products, fertilisers, mineral fuels, and pharmaceutical products.[70] China, South Africa and United Arab Emirates constituted the top three origins of imports to Malawi across 2018 and 2019 aggregated. [71]

According to 2018 data at HS6 depth, Malawi imported $1.51B, and was ranked as the 163rd trade destination in the world. Over the past five years the imports of Malawi decreased by -$1.53B, from $3.04B in 2013 to $1.51B in 2018.

The most recent imports of Malawi are topped by Packaged Medicaments ($97.7M), Broadcasting Equipment ($74.2M), Filing Cabinets ($53.5M), Delivery Trucks ($36.9M), and Coated Flat-Rolled Iron ($31.1M). The most common import partners for Malawi are South Africa ($453M), China ($222M), India ($179M), Tanzania ($118M), and Zambia ($84.6M).[72]

2.5. Food and Nutritional Security

Malawi's poor agricultural productivity has resulted in food shortages at both the national and household levels. The majority of smallholder farmers experience food insecurity, and around half of Malawi's child population suffer from acute or severe malnutrition. [73] Maize remains critically important to food security: 60% of the national caloric consumption comes from maize, nearly all farmers grow maize, and 50% of farmers grow maize exclusively.[74, 75]

Scarcity of arable land coupled with a growing rural population and climate constraints contribute to food insecurity. Malawi's arable land holding per person peaked at 0.40 hectares per person in 1971 when new land was designated and cleared for expanding agriculture, yet the ratio declined to an insufficient 0.22 hectares per person by 2016. Data from Malawi's Fourth Integrated Household Survey (IHS4) indicates that the proportion of households categorised as having very low food security increased from 32% during 2010/11 to 61.4% during 2016/17. In addition to shrinking land availability, some of this significant change in food security is attributable to crop failure due to El Niño in the latter agricultural season, an event attributed in part to climate change.[76]

The country is experiencing an increased dependence on food aid which ultimately equates to declining official development assistance (ODA) for agricultural and other development investment. It was recently estimated that 1.9 million people in Malawi were in need of food assistance in the first quarter of 2020. Moving forward, and partially resulting from economic disruptions stemming from COVID-19, SADC estimates that 2.7 million Malawians will experience food insecurity in 2020 (1.9 million from rural areas and 800,000 from urban).[77] Increased food insecurity is a result of income losses as well as disruptions to food supply chains. Lack of food security and increased reliance on food aid tends to increase during periods of drought and flood, events projected to increase in frequency with climate change.[78]

2.6. Public Institutional, Legal, Regulatory, and Policy Framework

2.6.1. Institutional Framework

The agricultural sector of Malawi is predominately managed by the Ministry of Agriculture, Irrigation and Water Development (MoAIWD), one of the key ministries in the government. The ministry's mandate is "to improve agricultural productivity and sustainably and development and manage land and water resources to achieve food, nutrition and income security for economic growth and development".[79]

In addition to MoAIWD itself, several ministries and government programs are involved in the policymaking and regulation that enable the agricultural sector to produce crops, access markets, and utilise various public services to improve agricultural productivity and reach.

Ministries and other public institutions which govern agricultural value chains in Malawi include:

Table 61: Public institutions governing and serving agricultural value chains in Malawi

Ministry	Relevant Departments	Public Entities
Ministry of Agriculture, Irrigation & Water Development (MoAIWD) [80]	• Agriculture Extension Services • Crops Development • Animal Health and Industry • Agriculture Research • Agriculture Planning Services • Land Resource and Conservation • Fisheries	

Ministry of Finance[81]	• National Statistical Office • The Treasury	• The NSO Demography Division; the Census and Demographic and Health Survey (DHS) • The Debt and Aid Management Division (DAD) • The Revenue Policy Division
Ministry of Foreign Affairs[82]	• Department of International Cooperation	• Division of Economic Affairs • Division of Regional Integration
Ministry of Natural Resources, Energy, and Environment	• Department of Forestry • Department of Climate Change and Meteorological Services	• Irrigation • Crop Protection • Crop Insurance • Crop Management • Early Warning System for Food Security • Climate Risk Management
Ministry of Industry [83]	• Industry Department	• Division for Industrial Development • Division for Competitiveness Enhancement
Ministry of Lands, Housing and Urban Development	• Department of Lands and Valuation	• Land Reforms Implementation Unit (LRIU)
Ministry of Local Government and Rural Development	• Directorate of Local Government Services • Directorate of Rural Development	• Local Development Fund (LDF) merged with National Local Government Finance Committee (NLGFC) • Public Works Program (PWP)

Ongoing projects relating to agricultural development and productivity enhancement, largely implemented by the Ministry of Agriculture (MoAIWD), include[84, 85]:

Table 62: Projects enacted by relevant government ministries and implementing partners

MINISTRY OF AGRICULTURE PROJECTS			
Project Name	**Implementation Period and Funding**	**Implementer**	**Details and Objectives**
Agricultural Commercialisation (AGCOM) Project	2018 – 2023 $95M project with a financial loan from the World Bank	MoAIWD in collaboration with Ministry of Industry, Trade and Tourism (MoITT)[86]	Increases commercialisation of select agriculture value chain products including crop, livestock, and fisheries products sold domestically or exported.
Agriculture Productivity Program for Southern Africa (APPSA)	2013-2020 Total project $90m from the World Bank, $29.8M allocated to Malawi for the first 5 years	MoAIWD and other Southern African countries	Promotes a regional approach to agricultural technology generation and dissemination; supports the strengthening and scaling up of regional centres of research. Any country in the Southern Africa region can participate in the initiative by committing to develop one of its agricultural research centres into a Regional Centre of Leadership (RCoL). In the current program Malawi, Mozambique and Zambia are participating in maize based farming systems, rice and legumes, respectively.

Agriculture Sector Wide Approach – Support Project (ASWAp-SP) and Agriculture Sector wide Approach II (ASWAp-SP II) Project	Funded by the European Union (EU), United States Agency for International Development (USAID), Norwegian Government, Irish Aid and the Flanders under Multi-Donor Trust Fund (MDTF); administrated by World Bank.	Second component implemented by District Councils with support from Roads Authority	Framework seeks to harmonise donor support in the agricultural sector. Provides a process for growth and wealth creation, an objective of the MDGS will be achieved. Component 2 of the project is Improvement of Rural Road Infrastructure to facilitate market access for farmers. The Roads Authority prepared Environmental and Social Management Plans for all the selected roads in the 12 districts and Abbreviated Resettlement Plans (ARAP) for one road per district that will be upgraded to bitumen standard.
Sustainable Agricultural Productivity Program (SAPP)[87]	2012-2021 $72M project; 89% funded by the International Fund for Agricultural Development (IFAD); supplemented by Government of Malawi and programme beneficiaries.	GoM	Goal to contribute to poverty reduction and improved food security among the rural population; achieve a viable and sustainable smallholder agricultural sector employing good agricultural practices (GAPs). Focus on simple, affordable GAPs to help bridge the considerable disparity between actual and potential crop yields. Implemented in six districts.
Smallholder Irrigation and Value Addition Project (SIVAP)	2013-2018 $39.6 million project supported by the AfDB	GoM	Sought to increase agricultural production and productivity through intensification of irrigation and crop diversification, specifically for irrigated rice and horticulture as well as crop diversification.. It also aimed at increasing income from agricultural production through value addition. Implemented in 12 districts. At the project's conclusion, 656,112 people, 46% of whom were women, benefitted; 132 hectares of roads were improved; and 2,210 hectares of land were outfitted with new irrigation and drainage services, exceeding the end-of-project target of 2,050 hectares.
Farm Input Subsidy Programme (FISP)	2005-present	GoM	To achieve food self-sufficiency and increased income of resource poor households through increased maize and legume production. Subsidised inputs include fertiliser and seed. The programme has been implemented since 2005/2006 and has had varying degree of success. For 2018/2019 FISP concentrated on maize fertiliser, cereal seed (maize, Rice, sorghum) and legume seed (beans, groundnuts, pigeon peas, soya beans, cowpeas).

Shire Valley Transformation Programme - 1 (SVTP-1)	14-year program (2018-2031) which will be implemented in three sequential but partially overlapping phases. Phase 1 will span 2018-2025 with $156M spending.	GoM through MoAIWD, with support from the World Bank, the African Development Bank and the Global Environment Facility (GEF)	The SVTP will irrigate 43,370 hectares of land by abstracting water from the Shire River at Kapichira and conveying it by gravity to the irrigable area in Chikwawa and Nsanje districts through canals. This will ensure a more consistent supply of water to farmlands throughout the year. The irrigation and infrastructure-heavy project will impact all value chains cultivated and marketed in the mentioned regions; attention is not dedicated to one specific crop or value chain.
Proposed program: Shire Valley Irrigation Project (SVIP)	Currently in project design phase	With assistance from African Development Bank (AfDB) and World Bank	The project is planned to cover 42,500 ha and to benefit 100,000 farm families (or a population of approximately 600,000 people) in Chikwawa and Nsanje. It will be implemented in two phases; by establishing market-linked smallholder farming ventures and professionally operated irrigation services.

2.6.2. Policy and Strategy Framework

Malawian agriculture is driven by several policies and strategies which take different approaches to goals like increasing productivity, sustainability, profitability, and overall positive economic benefits from agriculture, to name a few. Notable policies currently guiding the sector include:

Table 63: Key policies and strategies for agricultural development in Malawi

Name	Description
The Malawi Growth and Development Strategy III (MGDS III) (2017-2022)	The MGDS III was launched in 2018 and has recognised agriculture as one of the key areas within the Malawian economy. The strategy currently has 7 outcomes: • Increased agricultural production and productivity, • Increased land irrigation, • Increased agricultural diversification, • Improved nutrition and food security, • Increased agriculture market development, agro-processing and value addition, • Enhanced agricultural risk management, and • vulnerable groups in agriculture. The overall goal for the strategy is to achieve sustainable agricultural transformation and water development that is adaptive to climate change and enhances ecosystem services.
The National Agriculture Policy (NAP) (2016-2021)	The NAP was launched in 2016 with the sole purpose to provide clear and comprehensive policy guidance in the agriculture sector. The specific objective of the NAP is to guide Malawi to achieve transformation of the agriculture sector. The NAP has highlighted 8 policy priority areas which are: • Sustainable Agricultural Production and Productivity, • Sustainable irrigation development, • Mechanisation of agriculture, • Agricultural Market Development, Agro-processing and Value addition, • Food and Nutrition Security, • Agricultural Risk Management, • Empowerment of youth, women and Vulnerable Groups in Agriculture, and • Institutional Development, Coordination and Capacity Strengthening.[88]

National Agricultural Investment Plan (NAIP) (2017-2022)	The NAIP was launched in 2019 and provides a framework for guiding investment in the sector, ensuring coherence with overall and sectorial policy and investment frameworks. The NAIP adapts the goals set out in the NAP, namely ensuring sustainable agricultural transformation which will result in significant growth in the agricultural sector, expanding incomes for farm households, improving food and nutrition security for Malawians and increasing agricultural exports.
The National Irrigation Policy (NIP) (2016-2022)	The NIP was launched in 2016 with the aim at addressing critical issues affecting the irrigation sector. These issues include spatial and temporal water shortage; customary land tenure dispute; and poor operation and maintenance of infrastructure. The policy intends to address the aforementioned challenges by focusing on the following 3 priorities: • Sustainable Irrigation Development, • Sustainable Irrigation Management, and • Capacity Development.
The National Irrigation Master Plan and Investment Framework (2015-2035)	The objective of the Framework is to accelerate economic growth, reduce rural poverty, improve food security and increase exports. The Master Plan consists of four mutually support components, namely: • New irrigation development, • Sustainable irrigation management, • Capacity development, and • Coordination and management.
The National Rice Development Strategy (2014-2018)	The overall objective of this strategy was to increase rice production and productivity in Malawi. It had 4 specific objectives, namely: • To increase coordination and collaboration among stakeholders throughout the rice value chain, • To enhance the ability of cooperatives to improve farmer livelihoods, • To support increased productivity for smallholder rice farmers, and • To develop a strong rice market fuelled by demand and the production of value-added products. The Malawian Government is in the process of developing the second NRDS, as the review process of the first NRDS took place in 2019.

2.6.3. Legislative Framework

Agriculture holds great significance in Malawi not only as a source of income generation, but also for health and food security. As such, in addition to strategies and policies enacted by government entities, fully ratified legislation surrounding the sector in Malawi and establishing the basis for its governance also holds a place of importance. There two key, longstanding acts governing the agricultural sector in Malawi:

Table 64: Pertinent laws governing agriculture in Malawi

Name	Description
The Special Crops Act (SCA)	The SCA was passed in 1963 with the sole purpose of making provision for the development and marketing of special crops and for the establishment of Special Crop Authorities. While being implemented, a review of the SCA had shown that Parliamentary debates around the SCA were intense, as most of the Indigenous Malawians who were toiling on the gardens were living in poverty, while foreigners absorbed all the benefits from their work. The SCA gives the Minister of Agriculture wide-ranging powers to intervene in the market whenever "the Minister is satisfied that the development of any crop should be promoted or fostered. "[89] Special Crop Authorities are also empowered to pass regulations for the licensing of crops that are declared "special". Once a special crop is declared, any individual or firm involved in its production, processing, marketing and export may also then be subject to various licensing requirements. The conditions of these licenses vary, but mainly control the buying and selling of the crops and inputs for their production. Occasionally, the licenses set technical standards for processing and accounting of special crops. As of this year, at least nine special crops have been declared. These crops are: cashew, coffee, cotton, groundnuts, macadamia, tea, tobacco, tung and flue-cured tobacco.

The Agricultural (General Purposes) Act	The AGPA was passed in 1987 with the sole purpose to "make miscellaneous provisions for the general regulation of the agriculture industry".[90] Furthermore, the legislation was aimed at increasing cash crop production and reducing food crop prices by providing private traders with incentives to become fully engaged in agricultural marketing. Under the Act, the Minister may license the buying, selling or marketing of crops; decide who is permitted to obtain a license; set the minimum and maximum prices for a crop, and enumerate export procedures. The legal framework established by the Act further led to the passing of the Agricultural Produce (Marketing) Regulations. Under these regulations, a license is required to profit from or engage in the business of buying any agricultural produce from producers. Only Malawi nationals or businesses majority controlled by citizens of Malawi may apply for license. Conditions for these licenses are somewhat tight, limiting the period of the year during which one may purchase produce, and necessitating that only approved weights and measures be used, which are then subject to inspection.[91]

In addition to these two primary acts, other legislation that touches the sector includes: The Irrigation Act, Customary Land Act, Fisheries Conservation and Management Act, Land Resources Conservation and Management Act, Tobacco Act, and the Seed Bill.[92]

2.7. Development Partners, Organisations, and Initiatives

A list of high profile, relevant projects implemented by international development agencies, NGOs, CBOs, and the private sector include:

Table 65: Programmes and projects implemented by major international development agencies, NGOs, CBOs, and the private sector; 2010-2020

Project	Implementation Period and Funding	Implementer	Details and objective
Malawi Innovation Challenge Fund (MICF)	2014 - ongoing $22M funded by the United Nations Development Programme (UNDP), UK Aid, IFAD through the PRIDE Programme, Federal Republic of Germany through KFW, and the Royal Norwegian Embassy	Nathan Associates; Imani Development	Matching grants for innovative business projects, with the objective of alleviating risk in establishing new business models and/or technologies that have high social impacts.[93] Portfolio includes projects in Agriculture, Manufacturing, Irrigation and Finance. Ongoing initiatives address value chains such as tea, coffee, livestock, and other crops for domestic consumption and export.
Green Innovation Centre for the Agriculture and Food Sector (GIAE) Country Package [94]	2014-2022 18M Euro Commissioned by German Federal Ministry for Economic Cooperation and Development (BMZ)	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH; political partnership with Ministry for Industry, Trade, and Tourism (MoITT)	To improve production, productivity, and income for smallholder farmers with an emphasis on women and youth, and diversification. Three targeted value chains are: soybeans, groundnut, and cassava.

KULIMA – More Income and Employment in Rural Areas (MIERA)[95]	2015-2019 17M Euro Commissioned by German Federal Ministry for Economic Cooperation and Development (BMZ) and European Union (EU)	Ministry of Industry, Trade and Tourism (MoITT)	MIERA uses a value chain approach to support smallholders and MSMEs. Focuses on the downstream portions (processing, marketing) of the same value chains as its sister project, GIAE (above). Selected value chain markets targeted include: soybean, groundnut, cassava, sunflower, paprika/ chilli, rice and macadamia.
Financial Access for Rural Markets, Smallholders, and Enterprise Programme (FARMSE)[96]	2018-2025 $58M funded by IFAD, GoM	Ministry of Finance, Economic, Planning and Development	Goal to reduce poverty and improve livelihoods and resilience of rural households on a sustainable basis by tailoring interventions to a household's level of poverty. With a focus on rural farmers in poverty, mainly staple crops are supported by this project.
Agricultural Infrastructure and Youth in Agribusiness Project (AIYAP)[97]	2016-2022 $16M funded by African Development Fund	Ministry of Agriculture, Irrigation, and Water Development (MoAIWD)	Reduce poverty, encourage economic growth, and support food security with interventions such as irrigation infrastructure, expanding opportunities for youth, promoting import substitution to target value addition, providing loans, and commercialisation.
Commercial Agriculture for Smallholders and Agribusiness (CASA) Programme [98, 99]	2019-2024 Over €35M across three countries, supported by UK Department for International Development (DFID)	Implementing partners include: NIRAS; Swisscontact; CABI; TechnoServe; IIED; Malabo Montpellier	CASA invests in agribusinesses that source produce from smallholders, and showcases successful models in the hopes of attracting more investment. Services also include value chain support, technical assistance, and research. Specific focus on aquaculture and poultry.
Transforming Agriculture through Diversification and Entrepreneurship Programme (TRADE)[100]	2019-2026 $125M funded by IFAD, OPEC Fund for International Development	Government of Malawi	The goal of TRADE is to improve sustainable livelihoods of rural people in Malawi; with the specific objective of "Increased value chain commercialisation and resilience of rural poor and smallholder producers".[101]
Programme for Rural Irrigation Development (PRIDE)[102]	2015-2023 $84M funded by IFAD, GoM	Ministry of Local Government and Rural Development (MLGRD)	Reduce food insecurity and climatic shocks through climate-smart land and water management systems for smallholders engaged in rain-fed agriculture and cultivating on irrigated land.
Agricultural Commercialisation Project (AGCOM)	2017-2023 $95M funded by the World Bank	Ministry of Agricultural, Irrigation and Water Development (MoAIWD)	Objective of increasing commercialisation of select agriculture value chain products. Products include crop, livestock, and fisheries products sold domestically or exported.
Malawi Trade and Investment Programme (MTIP) Value Chain component	2021-2026 £13m funded by FCDO	To be determined – still in tendering phase	The VC component will focus on expansion of existing commercial/off-taker models in high value export sectors, essentially bringing high potential industries to scale. Sectors and value chains with the highest potential will be reviewed and selected during a 6 month inception phase.

AgDiv/Feed the Future Malawi Agriculture Diversification Activity	2016-2021 Funded by Feed the Future initiative via USAID	Feed the Future	A five-year project contributing to USAID/ Malawi's Feed the Future goal to reduce poverty and stunting, focusing on eight districts of central and southern Malawi. Activities target women and U5 children with nutrition behaviour changes and increasing nutrient-rich value chains.

2.8. Clean Energy

Malawi is typical of many African countries in relying heavily on biomass – mainly wood and charcoal – for a large part of its energy needs. However, what differentiates Malawi is the extreme to which this applies: the National Energy Policy estimates that no less than 93% of total energy demand is met by biomass energy. Households consume 84% of total primary energy and a staggering 99% of household energy is supplied by biomass. Firewood provides over 50% of urban cooking fuel and nearly 100% in rural areas.[103]

Despite the known and ongoing impacts of climate change in Malawi, relatively few projects or investments have sought to mitigate the risks by promoting the use of clean energy. Clean, renewable energy is an important aspect of climate-smart agriculture (CSA), defined by the by the Consultative Group on International Agricultural Research (CGIAR) and others as "agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/ removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals."[104]

Current Electricity Resources and Usage

Malawi experiences numerous challenges with energy supply including rising demand for electrification including in rural areas; insufficient capacity to generate power; high import bills for oil; lack of investment in new power generation units; high costs for energy transmission and distribution coupled with transmission losses; poor power quality and lack of reliability; heavily subsidised pricing; lack of access to modern electricity for a large segment of the population.[106]

Over 84.7% of Malawi's total population live in rural areas and access only wood and paraffin as major energy resources. The total electrification rate in Malawi is around 10%, with 37% of the urban population and only 2% of the rural population having access to electricity.[106] If current low rates of investment continue, Malawi is only projected to reach around 20% electrification by 2030.[107]

Recent estimates found that renewable energy sources contribute 0.3% to the country's electricity usage, primarily through solar and solar/wind hybrid, which is low even compared to other countries in the region; the current installed capacity of solar and solar/wind hybrid power is thought to be around 1 MW, compared against the country's total installed capacity of 430 MW (as of 2015). Meanwhile, the major sources of traditional biomass are firewood, charcoal and agricultural resides, which contribute 86%, 6.4%, and 6.6% respectively.[108, 109]

The use of biomass, namely firewood, contributes significantly to the very severe deforestation experienced in Malawi. The rate at which Malawi's population is growing – around 2,6% p.a. over the past 60 years[110] - is putting unsustainable pressure on its forests, which are being depleted at about the same rate annually.[111] While it can be argued that this is opening a corresponding area of land for arable farming, the country's forests and national parks are critical not only for biodiversity, but also for the revenue and employment from tourism that they provide. As Malawi is now importing increasing quantities of firewood and charcoal from neighbouring Mozambique, Zambia and Tanzania, the pressure is also rising on their forests and ecologies.[112]

While these challenges with traditional energy sources might suggest that there would be demand for alternative, clean energy, the opportunity to transition from traditional to clean energy production has remained largely untapped.

Domestic/Household Energy Dynamics

Although clean energy for domestic consumption versus commercialised agriculture have the potential to be quite different, domestic clean energy becomes increasingly relevant in the selected value chains of groundnuts, soya and rice as these three commodities are often produced, processed and consumed at the household level. Unsustainable fuelwood and charcoal are often used for rural energy, with as many as 97% of Malawians relying on biomass energy for cooking fuel. The harvesting of fuelwood, combined with poor agricultural practices, is a driving factor of deforestation and forest degradation in Malawi. There is a pressing need for rural livelihoods to be supported by clean energy sources, coupled with sustainable forest management practices.[113, 114]

There is also a gendered aspect to the adoption of clean energy, with women smallholders having lower access to and adoption rates of rural energy and labour-productivity enhancing innovations, including those which are sustainable and align with CSA; even when women smallholders are motivated to adopt CSA practices including clean energy, they lack the capital and decision-making power to embrace those practices. It will be important to overcome infrastructural gaps such as technology and energy gaps, and also knowledge and capacity shortcomings.[115]

Potentials for Renewable Energy

Malawi has a rich endowment of natural resources for renewable energy production, including its virtually unexploited resource of renewable hydropower energy, which is promising in terms of future efforts to supply clean energy.[116]

Rocky Mountain Institute (RMI), which has been working with UN-OHRLLS and the Government of Malawi to identify and overcome barriers to energy investment. RMI presents a framework for project prioritisation under three tiers:[117]

- Tier 1: "Quick win" projects, to be supported immediately with existing funding; "Quick wins" are defined as projects which reduce perceived risks of financiers/developers, improve future project economics, validate viable business models to unlock future funding opportunities, and support other quick win infrastructure projects.
- Tier 2: Projects to be prioritised in the near-term, defined as projects that enable additional connections and economic growth, and support other near-term key infrastructure projects.
- Tier 3: Projects to be prioritised in the mid-term to achieve energy goals in the next ten years.

RMI notes that an optimal investment pathway must be achieved through efforts by key stakeholders including the Government, investors, and development partners. Specifically, RMI suggests that the Government must support the 'right projects' in the 'right order' and capitalise on financial instruments to de-risk financing and investment, establish supportive policies to reduce investment risk, and ensure that the lowest-cost solution is implemented to provide affordable electricity options. Investors must target investments at priority project areas identified and publicised by government, and use climate finance to reduce overall financing costs. Finally, development partners are encouraged to simplify financing structures and increase access to climate finance, support a least-cost pathway through de-risking financial instruments, and provide technical assistance in the process of obtaining climate finance.[118]

2.9. COVID-19 in Malawi

The first cases of the novel coronavirus (SARS-CoV2, also known as COVID-19) were detected in April 2020. Malawi initially benefitted from the Government establishing a Special Cabinet Committee on COVID-19 to mitigate the number of COVID-19 cases before any cases of the illness had been reported within Malawi's borders.

COVID-19 has had multiple impacts on agricultural producers and SMEs, including actors in the groundnut, soya and rice value chains.

On 20th March 2020, GoM declared a State of Disaster and implemented restrictions on public gatherings, and closed all schools. The GoM also announced it would increase loans under the Malawi Enterprise Development Fund from MK12 billion to MK15 billion ($21 million) to cushion SMEs and MSMEs from the potentially detrimental effects of COVID-19 pandemic. An emergency cash transfer program was also announced to serve SMEs in and around the major markets in Blantyre, Lilongwe, Mzuzu, Zomba and others urban centres. On 1st April, all international flights were suspended save for those carrying health personnel and/or emergency health and relief cargo.[119]

Malawi's first confirmed case was detected on 2nd April and six days later GoM launched a multisectoral National COVID-19 Preparedness and Response Plan to limit the spread and impact of the virus. The Plan was estimated to cost about MK150 billion (US$203 million), though only MK6.5 billion (US$9 million) was available at the time of the launch.[120]

While cases were reduced by the end of 2020, a 'second wave' has been experienced since the December holidays and start of 2021. Cases spiked to more than 1,200 new infections per day in January and although numbers were lower by mid-February, the country is still experiencing +/- 200 new infections per day.

2.9.1. Impacts of COVID-19

Based on phone interviews conducted by MwAPATA Institute with 287 rural households in May 2020, all surveyed households reported having heard information about COVID-19, with local radio stations being the primary means of information dissemination (76%) and interactions with health care workers, neighbours, and television being other common means.

Evaluations of the impact of COVID-19 assert that significant numbers of agricultural SMEs will struggle to continue operations following the international pandemic unless there is coordinated and intentional support from institutions including banks, development finance institutions, impact investors, governments, and other development actors.

COVID-19 has had multiple impacts on agricultural producers and SMEs, including actors in the groundnut, soya and rice value chains. Some of the impacts documented by early reports include:

Financial and lending interruptions

While Malawi's central bank reduced its base lending rates with the intention of supporting SMEs' access to cheaper capital through banks and to overcome reduced liquidity, CASA found that respondents of its December 2020 evaluation had not received any subsidised loans.[121]

Farm-level production challenges

COVID-19 restrictions have resulted in shortages of labour, particularly for harvesting. However, fortunately, a September 2020 report by MwAPATA Institute notes that a majority of surveyed producers did not expect reduced production for the 2020 harvest, attributed to most producers relying on family labour and harvesting for household consumption rather than for marketing; of soybean producing households surveyed, just 9% expressed an expectation that their soybean yield would be reduced.[122] However, the same paper warns that as the pandemic continues into 2021 there is a great deal of uncertainty and that agricultural production could face far greater challenges.[123]

Supply chain interruptions

Given the closing of international borders, coupled with the fact that many farm inputs (especially fertiliser) are primarily imported, it is highly plausible that closed or restricted borders will lead to a lack of available and affordable farm inputs come planting season.[124] When asked, in May, if farming households expected the effects of COVID-19 to continue into the next main cropping season, a sizeable proportion (45% of the sample) anticipated disruption in the procurement of farm inputs and in carrying out land preparation activities (31%). An additional 12% indicated that they anticipated problems selling farm produce in the following year as well.[125]

Demand and market reduction

Across value chains in Malawi, market demand has been significantly reduced as 1) individuals' incomes have been constrained during the pandemic and 2) the closure of hotels, schools, and restaurants reduced demand. MwAPATA's May 2020 phone surveys have uncovered that a minority of respondents (20%) reported farm produce selling activities had been adversely impacted, Of those impacted, 47% experienced low prices, 30% experienced difficulties accessing the farm produce markets, and 23% had difficulties finding buyers.[126]

Food Security

While food scarcity has not been a documented issue at the global level, there are challenges to transporting adequate food supplies to populations in need, particularly in low-resource and rural settings prominent in Malawi.

Within Malawi, while fewer than 1% of transporters reported their revenues decreasing, a plurality of 24% noted that international border crossings are the most affected in the movement of agricultural products; fortunately, little international trade plays a small role in food supply in Malawi. The second most affected route, cited by 19% of trader respondents, was the busiest transportation corridor in Malawi (within Central).[127]

Additionally, 89% of wholesalers and retailers reported that food sourcing had been adversely impacted by COVID-19 due to either high prices and/or difficulty finding a seller. As of September 2020, MwAPATA Institute noted that these higher prices and scarcities would likely translate into consumers experiencing higher prices and a lack of diversity in available foods, especially as the pandemic continues.

The 2019/2020 growing season was projected by the Crops and Livestock Production Forecast to be a very strong agricultural year due largely to favourable weather. Maize, Malawi's main staple, was estimated at 3.6 million metric tons in the year 2020. This estimate is about 25% higher than the five-year average and 6% higher than the previous year. Production of the three primary value chains of this analysis – groundnut, soya and rice – were also expected to increase; groundnut production was expected to be 424 thousand metric tons, representing a 4% increase from the previous main season, and soya production was expected to increase by about 20% to 0.27 million metric tons. However, the presence of COVID-19 contributes new challenges in meeting these expectations, particularly as the pandemic onset aligned with the country preparing for the April harvest (given that Malawi's primary growing season is November through April).[128]

2.9.2. Recommended Interventions for Development Actors Addressing COVID-19

As Malawi and its agricultural sector continue to experience the effects of COVID-19 into 2021, supporting SMEs and primary producers in the groundnut, soya and rice value chains is increasingly important. Although the impacts of the pandemic have been relatively minor in these sectors, which are produced largely by family labour and for household consumption, the virus poses a threat to the importation of key inputs, increased food and transportation prices,

and market access. Access to finance, which was already precariously limited for these three value chains, has been further restricted despite being a powerful tool in ensuring financial stability and safeguarding against the impacts of COVID-19.

Throughout the COVID-19 pandemic, restrictions have prevented agricultural actors from accessing financial services, particularly rural users who are required to travel with public transport to access physical bank/institution branches. Increased digital financial service provision will be key to preventing the interruption of finance as second waves of COVID-19 emerge and in preparation for future health emergencies with similar consequences.

Continuing to monitor food prices, which serve as a strong proxy for the overall wellbeing of the agricultural food sector at this juncture, is crucial. Spikes in food prices can indicate decreased food supplies or bottlenecks in transportation. While there are legitimate reasons for traders buying goods at lower farmgate prices during the pandemic, such as higher transport costs, decreased demand, etc. it is also possible that traders may take advantage of reduced selling outlets for farmers and offer less competitive prices.[129]

Continuing to monitor availability of predominantly imported fertiliser will also be important to ensuring that farmers grow productive yields of groundnut, soya and rice in 2021.

2.10. Value Chains Selected for Analyses

Based on the current status of the agricultural sector in Malawi, particularly related to access to credit and finance for value chain actors, three agricultural commodity value chains have been selected for further analyses and investigation. These value chains are: groundnut, soybean, and rice. The following sections will detail the current statuses of these value chains, identifying ongoing challenges and opportunities for growth.

3. AGRI-FINANCE SECTOR LANDSCAPE IN MALAWI

The agricultural finance sector in Malawi is best understood as cutting across the three value chains explored herein. In Malawi, most smallholder farmers grow multiple crops rather than specialising in one; this risk-mitigation strategy of diversification is particularly relevant due to the volatility in prices and market access seen from year to year, and in light of climate shocks that impact growing seasons and crop viability. As such, it is difficult to isolate agricultural finance availability to one distinct value chain and looking at the total landscape and availability to value chain actors across crop sectors offers a more comprehensive approach. The needs of oilseed value chain actors, applicable within the scope of this work to groundnut and soya producers, are particularly interchangeable as most smallholders and SMEs will deal in both goods.

While rural finance and agricultural finance are not interchangeable, with rural livelihoods and enterprise activities being more diverse than farming and having more diverse financial needs, many recipients of agricultural finance are rural-dwelling.[130] Within farming, finance needs also vary with different value chain actors requiring access to different financial products. Beyond activity-based needs, financial needs also vary greatly for both on-farm and off-farm activities with the seasonality of farming.

Within farming, finance needs also vary with different value chain actors requiring access to different financial products. Beyond activity-based needs, financial needs also vary greatly for both on-farm and off-farm activities with the seasonality of farming.

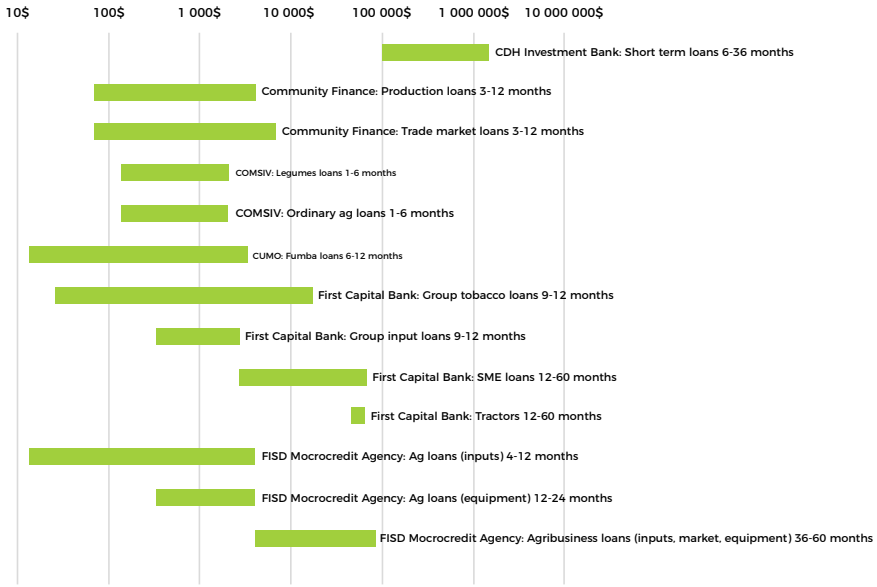
3.1. Availability of Agricultural Finance and the Need for Segmentation

A combination of microfinance institutions, cooperatives, extension service providers, and banks offer a range of formal and informal agricultural financial services in Malawi, but they are seen to be insufficient. Part of this insufficiency is attributable to a lack of segmentation of the market; financial institutions fail to offer financial products (primarily loans) that reach the full range of rural and agricultural clients interested in credit. While mature financial markets include a broad range of products offered to a wide variety of demands, Malawi experiences a less mature finance market with limited scope and offerings.

Figure 35 illustrates the current offerings of loans available in Malawi, as provided by Opportunity International. Most of these loan products fall within the $100-$1,000 range, targeting smallholder farmers, but they are relatively few given that the agricultural sector accounts for at least 26% of the country's gross domestic product and 83% of the population lives in rural regions whose primary economic activities are within the agricultural sector.[131] Some institutions have developed SME-specific loan products (valued around $10,000) for agribusiness operators; however, fewer financial service providers offer SME loans for agribusinesses, attributable to the perceived risk involved in the SME sector, limited access to collateral for clients and lack of available capital for larger agricultural loans. Most loans are short term (<12 months) which lend themselves to smaller overall loan values.

While there are financial products servicing several segments of the several value chains, seed-specific products are notably missing. Most products are designed for expenses such as production, equipment, or working capital, and none were found to be targeted at women. As such, there is the opportunity for new financiers to support seed-specific products, particularly for women; at present, women receive a mere 7% of agricultural investment.

Figure 35: Sample of existing agricultural financial products



Source: Opportunity International (2020)[132]

As seen in Figure 35, several private banks offer at least one agricultural finance product, although these products may not be realistic for value chain actors based on terms and availability. First Capital Bank is noted as the provider with the widest range of agricultural financial services available, and their offerings include group loans for smallholder farmers, SME loans for agribusiness entrepreneurs and larger farmers, as well as SME mechanisation loans. FISD Microcredit Agency also markets to both smallholder farmers and agribusinesses with its loan product offerings. Other financial service providers tend to specialise agricultural lending to one specific segment rather than lending more widely down the value chain.

There are 12 commercial banks in Malawi — of which five are local and seven are foreign — with varying levels of local ownership. None of these banks are owned by the government.[133] Opportunity International provides the following profiles of the capacity of financial service providers in Malawi, focusing specifically on capacity to increase seed and input financing for SMEs:

Table 66: Profiles of Malawi's primary banks and capacity to lend to SMEs

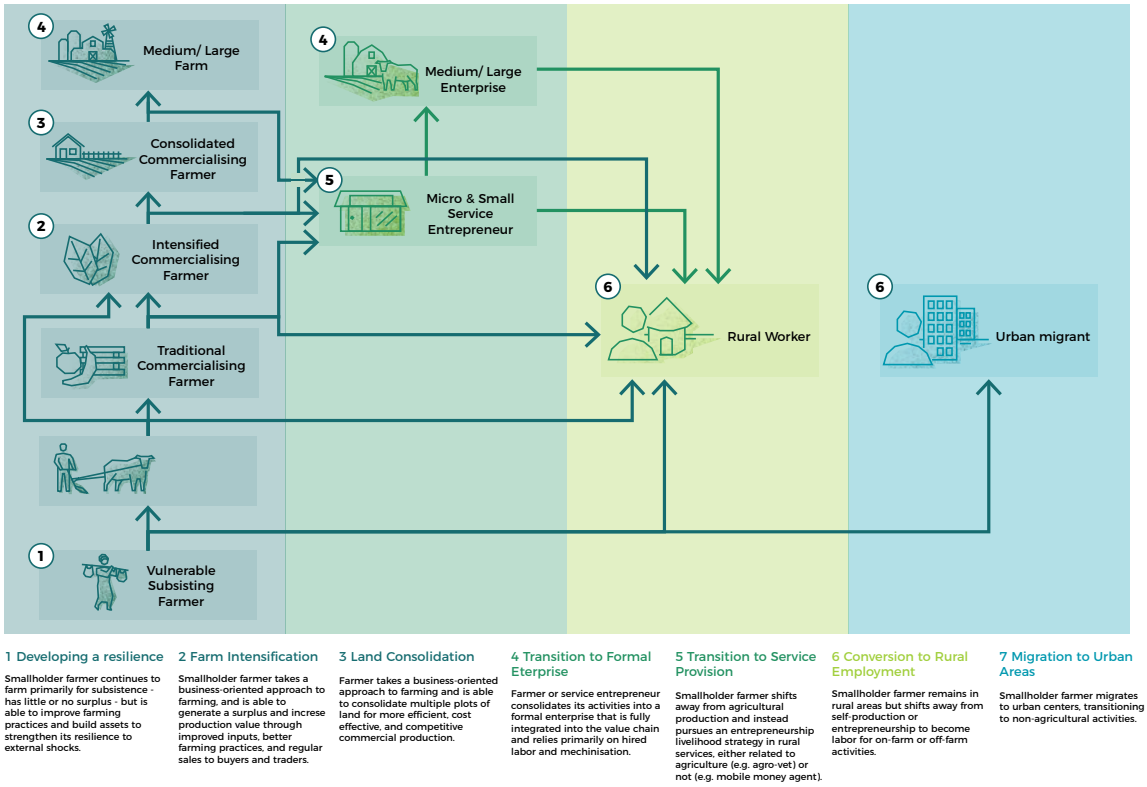
Financial Institution	Capacity
First Capital Bank	First Capital Bank offers the highest potential to increase its lending to the seed sector. FCB maintains one of the largest deposit bases in the country and a reasonable cost-to-income ratio. FCB acquired Opportunity International Bank of Malawi in 2017, which was established by OI and led in the provision of agricultural financial services at that time.
NBS Bank	NBS Bank historically lent to the tobacco sector but stopped its agricultural lending following significant losses. If able to reduce its cost-to-income ratio, NBS Bank will offer potential for agricultural lending. NBS recently established a new business unit to provide lending for mechanisation, leasing, SMEs and specific smallholder projects, displaying interest but also communicating its need for TA support to design suitable loan products.
CDH Investment Bank	Relatively small in terms of overall portfolio size and value of deposits, CDH is a newer bank with opportunities to grow. CDH Bank reported specific interest in lending to SMEs, likely to agribusinesses in urban and peri-urban regions, which is realistic due to the Bank's limited geographic presence.

National Bank of Malawi	National Bank of Malawi has experience lending to the tobacco sector. If incentivised and assisted to diversify their agricultural products away from tobacco and into other crop chains, it does have sizable value of deposits and low cost-to-income ratio.
FINCA	FINCA provides limited lending to Malawi's agricultural sector, due to the perception that agricultural lending carries higher risk than other lending.

In order to expand beyond the financing products explained herein, and to eventually capitalise on the capacity of banks as outlined above, several stakeholders have indicated that a process of increased segmentation is necessary.

The 2019 Rural and Agricultural Finance State of the Sector Report, jointly published by the Mastercard Foundation Rural and Agricultural Finance Learning Lab and ISF Advisors, presents the following pathways model (Figure 36). As per the report, "the rural pathways model moves us from a static understanding of rural households based on their characteristics at a particular moment, toward a dynamic view of how households and their needs might evolve over time. This model lays out the different transition pathways rural households may take as they pursue increased resilience and agency through various livelihoods strategies."[134]

Figure 36: Rural Pathways Model: A new way of thinking about rural clients



Source: Pathways to Prosperity (2019)[135]

The pathways model was borne out of the recognition that a gap in smallholder and agricultural SME finance exists, and that a pathways or segmented approach can facilitate funders channelling capital more efficiently towards rural service provision. On the micro level, the pathways model, along with a system of service provider segmentation, can aid in determining what types of financial service providers are best suited to offer financial products to different rural and agricultural clients.

In addition to the pathways model, relevant literature also explores the concept of the 'underserved middle' of SMEs seeking agricultural financing.[136] On the larger end of borrowers, with financial needs much larger than typical smallholders/primary producers, are scaling enterprises. These scaling enterprises exist as input supply companies and agri-dealers in the pre-production phase, medium-sized commercial farmers on the production side, and aggregators, processors, transporter and retailers downstream. These larger enterprises are referred to as the 'underserved middle' due to the lack of financial services catering to them.

These scaling enterprises typically self-fund with savings, profits and informal sources of lending from their families and communities in the initial phases. In terms of formal financing, early lending often comes from value chain partners, MFIs, and other concessional lenders. However, beyond these formal entities, many SMEs hoping to graduate into commercial bank loans find that they are unable to access them due to costs, lack of available funds, lack of formal business registration, and failure to produce account history or collateral. Concessional funding from impact investors and other DFIs mainly targets high value lending (estimated to be $2 million USD and higher), stranding these mid-sized enterprises in the 'missing middle': their investment needs are too large for highly concessional funders (such as grant-makers and local micro financing institutions) but the costs to reach higher-value lenders (banks, DFIs and impact investors) are too great. Their needs are estimated to be between $50,000 and $2 million, highly concentrated in the $10,000-$100,000 range and typically in debt.[137]

Some of these 'missing middle' actors are able to access funding for operational costs through value chain partners, but lack the financing for capital investments, leaving their needs partially but insufficiently covered. Ultimately, CASA presents evidence that this underserved middle lacks the mechanisms needed to access finance, policymaking, and institutions that ought to be available to them. CASA offers the definition of the underserved middle as "a diverse range of SMEs at all stages of the value chain; these are characterised as being unable to exploit the potential to scale that exists in the market due to their effective exclusion from normal market-supporting policies, financing and institutions."[138] Thus, the existence and challenges of the 'underserved middle' make a strong case for the further need for segmentation of financial offerings and the avoidance of one-size-fits-all lending to Malawi's agricultural value chain actors.

3.2. Seed and Input Financing

As previously noted, there is a gap in available finance products when it comes to seed financing, leading seed producers and dealers to access more broad financial products. At the same time, the production and dissemination of high quality, disease- and bacteria-resistant, affordable seed is noted as a priority in the development of all selected three value chains.

One Acre Fund (OAF) is an agricultural financier that provides financing in the form of seed and inputs rather than cash, with groundnut farmers comprising a large portion of its clientele in Malawi. OAF is one of the few large organisations offering stable inputs for crops outside of tobacco companies. When OAF's beneficiary farmers receive loans, they are in amounts of $75-80 per season; values lesser than the minimum loans most FIs are willing to grant. OAF notes that in addition to annual pre-season loans, farmers experience extremely volatile and unpredictable mid-season cash needs, sometimes sparked by events such as a pest outbreak or disease.

3.3. Key Challenges for Financial Institutions

At present, the perception of farmers among banks is not strong, and smallholder producers lack creditworthiness. One way forward on this issue is to focus attention on channelling interaction between these different actors (i.e. banks, DFIs and smallholder farmers though farmers' co-operatives and producer associations). The use of group structures has been seen to

empower the individual. There also appears to be an untapped demand for credit in many rural areas, which could be serviced by financial providers such as micro-finance institutions (MFI): approximately 50% of all MFI are located within the three largest cities. Therefore, there are the potential for mutual benefits through expanding services from MFIs into more rural areas, to accommodate for >80% of Malawians who live and work in rural areas.

FIs have insufficient information about farmers, and particularly about farmers' abilities to produce crops to repay loans provided and their ability to manage significant sums of money over time.

While FIs may not be inherently opposed to providing credit and finance to smallholder farmers and other value chain actors, certain challenges obstruct the process and increase the risk assumed by FIs. One of the most significant barriers to agricultural lending is the internal operational capacity of FIs. FIs lack information about their clients and are unsure of who they are lending to and thus, their ability to repay loans. With many people sharing similar names and lacking official identification, FIs' internal capacity to organise data and track clients is lacking. Building digital profiles for farmers and other borrowers, including data such as their credit score, has been piloted as a solution and is discussed further in the Recommendations included with this report.

Lack of internal capacity translates into excessive turnaround time for lending approval. In a rainfed agricultural economy, finance becomes nearly worthless if not disbursed before the rains start. Digital farmer profiles piloted by Opportunity International in Uganda were effective in reducing loan approval times from 60 days, to just 4 days. Biometric identification systems have also been piloted to address the asymmetry of information between borrowers and lenders in Malawi.

FIs have insufficient information about farmers, and particularly about farmers' abilities to produce crops to repay loans provided and their ability to manage significant sums of money over time. One solution is to increase contract farming and establish a system whereby more commercialised farmers, who have demonstrated their business management skills and abilities to oversee finances, receive financing from banks and in turn disburse these funds to the contract farmers who supply crops to them. Similarly, traders and aggregators can be valuable intermediaries in the lending process, as they are incentivised to support farmers in producing higher yield and higher value crops.

NASFAM, through the PROSPER Project, looked at incentive-based contract farming systems which sought to reward farmers for filling contracts rather than penalising them for failing to do so, thus readjusting the risk calculation and incentive structure of the contract farming arrangement.

Opportunity International has identified natural disasters' adverse, unpredictable effects on agricultural productivity and civil unrest and political protests as other factors reducing FIs' willingness to lend. The Reserve Bank of Malawi is also thought to be highly conservative in terms of policies to hedge against lending risk, which is likely to encourage smaller agricultural portfolio sizes at financial service providers.[139] Ad-hoc Government intervention in the markets with price controls, import and export licencing and exports bans create insecurity in the markets which increase the risks of lending by the banks.

3.4. Barriers for Borrowers

Chipeta and Kanyumba (2018) provide the following table summarising the literature on certain demand factors and the impact (dichotomised as positive or negative) they have on access to commercial banking services. While these factors are not specific to agricultural lending, they are applicable in the context of determining which agricultural actors are banked in Malawi. Given that a lack of banking history with an FI is a common reason agricultural loans are denied, it is relevant to determine which smallholders, based on common demographics, are more or less likely to access banking services. An additional factor discussed by Chipeta et al. (2018) is location – the authors show that the physical distance between one's household and the nearest bank branch is a strong indicator for how likely it is for that household to be banked. Given that

banks are more likely to take advantage of economies of scale and locate their branches in urban centres, rural folk are therefore less likely to access banking.[140]

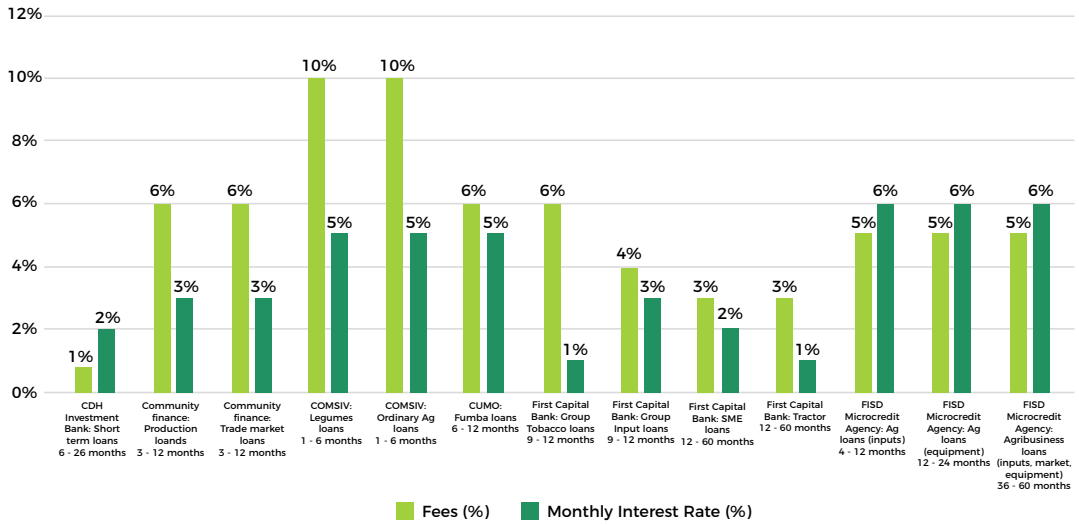
Table 67: Demand factors impacting access to banking services

Number	Demand Factor	Impact on Access	Authors
1	Lack of requisite collateral	Negative	Levine, 2005; World Bank, 2007; Ncube and Senbet, 1997; Anyawu, 1992
2	Lack of credit histories	Negative	Levine, 2005; World Bank, 2007; Ncube and Senbet, 1997; Kashuliza and Kydd, 1996
3	Lack of connections	Negative	Levine, 2005; World Bank, 2007; Ncube and Senbet, 1997
4	Not enough money	Negative	Demirguc-Kunt and Klapper, 2012
5	Number of necessary documents	Negative	Beck, Demirguc-Kunt, and Peria, 2006; ACEF Centre, Montreal, 1996
6	Withholding funds pending clearance of cheques	Negative	ACEF Centre, Montreal, 1996
7	Increasing service charges	Negative	Beck, Demirguc-Kunt, and Peria, 2006; ACEF Centre, Montreal, 1996
8	Financial illiteracy	Negative	Kashuliza and Kydd, 1996; Anyawu, 1992; ACEF Centre, Montreal, 1996
9	Minimum account balances	Negative	Anyawu, 1992; ACEF Centre, Montreal, 1996
10	Inequality in income distribution	Negative	Bhandari, 2009; Anyawu, 1992
11	Lack of investment opportunity	Negative	Bhandari, 2009
12	High consumption	Negative	Bhandari, 2009
13	Poverty	Negative	Bhandari, 2009; Levine, 2005; World Bank, 2007; Ncube and Senbet, 1997
14	Gender	Negative	Kashuliza and Kydd, 1996
15	Education	Positive	Demirguc-Kunt and Klapper, 2012; Allen et al, 2011
16	Age	Positive	Demirguc-Kunt and Klapper, 2012
17	Interest rate on loans	Negative	Beck and De la Torre, 2007
18	Sources of income	Positive	FinMark Trust, 2014

Source: Chipeta and Kanyumbu (2018)[141]

In addition to the barriers to banking in general named above, there are additional and compounding barriers to loaning when and if these financial institutions are accessed. Excessively high interest rates have been cited as a leading barrier to smallholders and other value chain actors accessing loans. Figure 37 presents interest rates in Malawi, as per Opportunity International scoping data. Smaller loan v`alues are associated with larger fees, as tends to be standard across lending; for example, COMSIV's 1-6 month loans represent some of the lowest loan values ($100-$1,000 USD) yet carry 10% fees and a 5% monthly interest rate.

Figure 37: Sample of Malawi fees and interest rates by loan type and provider



Source: Opportunity International (2020)[142]

Agricultural smallholders and SMEs often lack capacity to produce the financial records, ledgers, asset registers and tax documentation required to access loans. Producing these documents requires not only accurate record and bookkeeping, but also written literacy, financial literacy, technological literacy, and access to a computer/tablet.

Lack of access to collateral also prevents borrowers from being seen as trustworthy by FIs. Coupled with a lack of insurance coverage, smallholders and SMEs lack evidence that they will be able to successfully repay loans. ACE's warehouse receipt system offers one credible solution, whereby the value of crops deposited into a warehouse is communicated to FIs. Still, the warehouse receipt solution offers certain challenges and remains inaccessible to smallholders who face infrastructural/geographical access challenges and/or do not produce a high enough quantity of goods to take advantage of the system.

3.4.1. Barriers for Women

As highlighted throughout this report, various social and cultural dynamics limit the productivity and capacity of women and women-owned farms/land parcels; Malawi's fourth integrated household survey (IHS4) indicated that only 13% of surveyed households included at least one household member who had obtained a loan in the 12 months prior to the survey, and when this data was disaggregated by gender it was found that more male-headed households had access to credit (14%) compared to female-headed households (10%)[143, 144]. Lack of access to financial resources results in a 28% productivity gap between male and female managed agricultural plots.[145]

Microfinance has also been a prevalent strategy for increasing women's access. However, fewer programs have addressed the cultural and social norms and expectations that prevent women from acquiring and controlling the resources necessary to access formal financial institutions and finance.

A lack of financial products geared towards female agricultural actors is one of the factors that undermines productivity and equality in the sector. Improving the financial inclusion of women into Malawi's agricultural finance sector will involve significant, systematic changes in financial offerings, as well as societal attitudes, laws and policy, and cultural norms.

Barriers to Access

In informal and formal financial settings, women are disadvantaged by a lack of both agricultural assets (land, agricultural labour, water and livestock) and non-agricultural assets (forest resources, domestic consumables and durables, luxury items)[146]; for example, livestock can be used as collateral finance in informal credit markets, and women's livestock holdings tend to be much lesser than those of men – therefore acting as a barrier to women proving

creditworthiness and accessing collateral-based finance for crucial farm inputs at the same rate as men[147]. In addition to being listed as collateral for loans, these agricultural and non-agricultural assets can be leveraged for safeguarding against income and agricultural shocks and income-generation through the collection of rent payments, interest, and profits.

Constricted decision-making power also limits female access to credit and finance in the agricultural space. Even when women are the technical owners of land parcels, which is relatively common given that matrilineal lineage systems exist within Malawi, in practice men often act as the primary decision makers. Women smallholders are constrained in decision making power in terms of crop choice and land allocation, hired labour oversight, spending and reinvesting revenues generated from agricultural outputs, farm inputs, and agri-business development including whether to access finance and through which avenues (i.e. informal or formal financial institutions or other means).[148, 149]

Potential Pathways to Increasing Women's Access

Of the available channels for financial inclusion, community based financial organisations (CBFOs) are especially relevant to women; CBFOs in Malawi have an estimated 1.1 million urban and rural members from all income strata, and an estimated 47% of these participants are women[150]. However, access to loans and finance through formal financial institutions which might grant larger loan sizes is less available.

In terms of agricultural SMEs and firms, the World Bank found that women are particularly impacted by the barriers to formally establishing firms in Malawi, particularly the transaction costs associated with business registration. When registration was made virtually costless, 73% of women-owned firms chose to register. Combining the option to register at little to no cost with an information session at a bank (including access to a business bank account) led to increased use of formal financial services, sales, and profits of women-owned firms[151]. These findings suggest that targeted can increase the financial inclusion of women in agriculture at the firm-level.

In terms of the financial products offered, a suite of female-inclusive financial services must cater to the differing ability of women to prove creditworthiness based on the limitations and constraints outlined here. Alternative credit scoring mechanisms could be valuable in reimagining how female creditworthiness is considered. Given that women, and particularly women smallholders, lack access to the same resource endowments as men, financial products conceptualised around traditional collateral (such as land, livestock, physical farm and non-farm access typically owned and controlled by men) will remain largely unsuccessful in awarding credit to women.

Previous projects focused on integrating women into agricultural finance have largely worked through group lending (VSLAs and CBFOs). Microfinance has also been a prevalent strategy for increasing women's access. However, fewer programs have addressed the cultural and social norms and expectations that prevent women from acquiring and controlling the resources necessary to access formal financial institutions and finance. Moving forward, addressing women's capacity to access formal and informal credit mechanisms will involve improving the overall resources held by female farmers including encouraging the reallocation of resources and decision-making power.

3.5. Conclusions

Malawi represents a relatively small market in terms of agricultural finance; Opportunity International found that of FSPs it surveyed in Malawi, the total gross loan portfolio for agriculture was valued at $1.4 billion out of the $15.3 billion total portfolio value. With the exception of tobacco farmers, who major tobacco companies have typically facilitated credit for, many smallholders are unable to access commercial banking and agricultural finance. Barriers exist in both the documentation farmers are able to produce, and the internal capacity of lending institutions to score farmers' credit when traditional records are unavailable.

4. GROUNDNUTS

4.1. Current Status of the Groundnut Value Chain

4.1.1. Primary Production

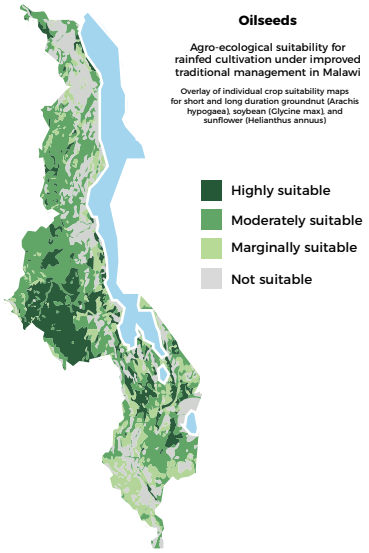
Groundnuts, also known as peanuts (Arachis hypogaea), are an oilseed crop which grow well in tropical and subtropical parts of the world, including Malawi. Groundnuts contain 48-50% oil and 26-28% protein, as well as important dietary fibre, minerals, and vitamins. Of the legumes and pulses produced in Malawi, groundnuts occupy the largest area of cultivation (29% of area). In terms of volume, groundnuts are thought to be the second most important legume accounting for 29% of the total volume produced (following pigeon peas, which comprised 35% of total volume grown).

In terms of volume, groundnuts are thought to be the second most important legume accounting for 29% of the total volume produced (following pigeon peas, which comprised 35% of total volume grown)

Geographic growth and productivity

Groundnut production is concentrated in Malawi's central region, with Mchinji, Lilongwe, Kasungu and Ntchisi growing 70% of the country's groundnuts. The Lilongwe and Kasungu Agricultural Development Divisions (ADDs) alone account for 50% of national production[152]. Most areas of the country (save for the alluvial areas of the Lower Shire Valley and around Lake Chilwa which frequently flood, and the Rift Valley escarpments between the mid-altitude plateau areas to the Lakeshore) are suitable for the production of groundnut and other oilseed crops[153]. Figure 38 provides a detailed ecological suitability map indicating which areas of Malawi are highly suitable, moderately suitable, marginally suitable or not suitable for the production of groundnuts.

Figure 38: Crop suitability map for production of oilseeds, including groundnuts



Source: Benson, Mabiso, and Nankhuni (2016)[154, 155]

Groundnut is a predominantly rain-fed crop either grown as a sole crop or intercropped with cereals such as maize, sorghum or millet, or grain legumes. It is particularly useful when intercropped due to its ability to fix atmospheric nitrogen in soil, reducing the need for and costs associated with fertiliser[156].

There are more than 10 government-released groundnut varieties in Malawi. The most widely used are Chalimbana (grown by 67.1% of farmers) and CG7 (64.3% of farmers).[157] Chalimbana and CG7 are the most popular varieties because of their suitability for groundnut flour and high oil content respectively. Malawi's Ministry of Agriculture (MoAIWD) also promotes the Nsinjiro, Baka, and Kakoma varieties[158]. As tobacco companies have transitioned away from tobacco and into food crops, several have pursued smaller and more confectionary varieties of groundnuts to feed into high value-added products such as chocolates.

The CG7 and Nsinjiro varieties yield an average of 1,000kg per hectare, and Chalimbana yields an average 600kg/ha. Because nearly all of Malawi's smallholder groundnut production is exclusively rain-fed, the success or failure of groundnut crops are highly contingent on adequate rainfall. Soil quality is also important to the production of palatable, profitable, and safe groundnuts. As of 2012, around 368,000 hectares are allocated to groundnut production[159].

Malawi's IHS4 survey data indicates that 15.5% of all households that engage in any crop production produce groundnut, and much of this production is for household consumption — over 40% of groundnut farming households do not sell any of their production[160]. A 2017 analysis indicated that households produce, on average, 196kg of groundnuts and profit around MK13,270 or $22.57 per year. The average total land cultivated is around 5.22 hectares (ha), and IHS4 data shows that groundnut farmers allocate around 17.4% of their land to groundnuts, averaging 0.15 ha.[161] The majority of groundnut producing households are male-headed (77%) and the average household size is 5. Only 5% of producers access extension services[162].

In general, women often participate in groundnut farming activities requiring more intensive labour, such as harvesting and shelling, and have different (typically less) access to resources and extension services than men. Women tend to have lower membership in rural organisations and access to information, inputs and markets[163].

According to FAO data, the world average for groundnut yields increased by over 40% between 2007 and 2017. In the same time period, Malawi experienced a volatile yield — although it increased by 25%, the yield is still half of the world average and is highly vulnerable to environmental conditions such as floods and droughts.

Domestic consumption

Groundnuts are an excellent source of proteins, fats, vitamins, and minerals for humans and animals. A single groundnut, on average, contains 48% fat, 26% protein, 17% carbohydrates, 2% fibre, 2% ash, and 1% vitamins and minerals including vitamin E, niacin, folate, manganese, magnesium, and phosphorous. Groundnuts also contain bioactive substances like flavonoids, phytosterols, and resveratrol, which are thought to decrease risks for cancer and coronary heart disease (CHD)[164]. The Food and Agriculture Organisation (FAO) estimates that a handful (around 30g) of groundnut a day could address many malnutrition cases in developing countries like Malawi. Despite this evidence and relatively high production, consumption in Malawi by volume remains low (around 13g/day).

A 2018 survey indicated that 99.4% of 489 Malawians consumed groundnut (in any form and quantity) and the majority (70.4%) consumed groundnut at least three times per week[165]. About 54% of participants expressed that they were willing to try new foods; those with post high school education were 2.75 times more likely to try new foods. Men were 1.90 times more likely to try unfamiliar foods than women, which has implications on the marketing of groundnuts given that gender roles in Malawi are such that women predominantly select and cook food for the household.

Surveyed consumers signified that they consumed roasted groundnuts (65% of respondents), nut flour (64%), peanut butter (63%), boiled nuts (49%), peanut cooking oil (48%), and raw nuts (39%). Consumers with no education to high school education were 2.35 times more likely to eat

any form of groundnut product more often than consumers with higher education[166]. Ranked by preference, peanut butter was indicated as the 'favourite' product (33%), followed by nut flour (31%) and roasted nuts (19%)[167]. Qualitatively, groundnut flour was preferred due to its versatility and to season other foods, roasted nuts for their low price, and peanut butter for its energy density and taste/texture appeal[168].

Groundnuts also make an indirect contribution to food security by increasing incomes and access to high nutrient foods for actors in the value chain. Roughly 25% of Malawian groundnuts are traded and consumed within the country and 15% are traded to the regional market.[169]

Although important to food security, high levels of aflatoxins — highly toxic metabolites produced when crops experience fungal infections and made worse by poor management practices — can be damaging to health and food safety[170]. Despite Malawi having a strict limit for domestic aflatoxin levels (limited to 3 parts per billion [ppb] compared to the European Union's 4 ppb) around 49% of groundnut sold in local markets and 60% of those sold in shops in Malawi were found to have aflatoxin levels higher than the safe level for humans to consume. Enforcement of these standards is limited to two random checks per year according to the Malawi Bureau of Standards[171].

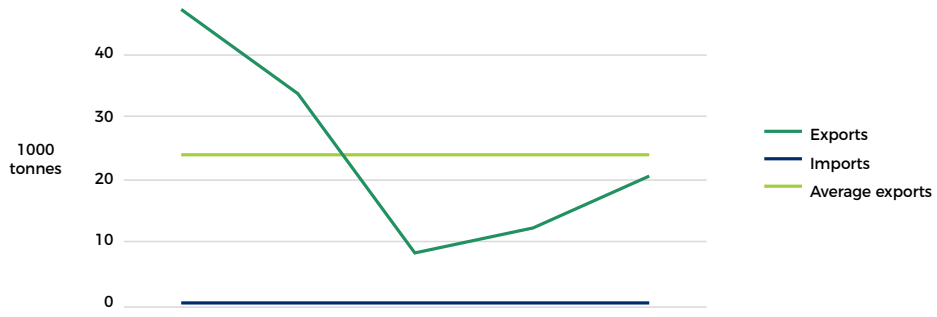
Domestic consumption trends are expected to grow. In 2018, the annual farmgate production value of domestic consumption was estimated to be around $120M, expected to grow to $400M by 2028. Population growth is estimated to increase demand for direct consumption by 7.1% per annum by 2025[172].

Percentage marketed and traded internationally

Globally, the groundnut sector creates around $15.26 billion USD in export values annually. This is lower than international export values for comparable oilseed crops of soybeans ($92 billion in 2017) and sunflower ($17.2 billion), but still significant.[173]

Malawi does not import any groundnut at this time, as all domestic consumption demands are met by domestic production. Malawi is a notable exporter of groundnut seed and provides the third highest value of groundnut seed annually ($2.6M) behind only Myanmar and the United States, and closely followed by the Netherlands and Uganda. Figure 5 shows Malawi's groundnut exports in tonnes in recent years. The five largest groundnut seed importers internationally are Belgium, Malaysia, Rwanda, Myanmar, and Mexico. The five largest SSA importers are Rwanda, South Africa, Kenya, Mauritius, and Zambia. From a recent period of 2015-2017, Malawi's groundnut seed exports were primarily to South Africa and Mozambique. During the same period Malawi imported notable quantities of groundnut seed from Kenya, South Africa, Zimbabwe, Zambia and Tanzania.

Figure 39: Malawi's groundnut exports and imports



Source: FAOSTAT (2019)[174]

Malawi is also the second largest exporter of shelled groundnuts in sub-Saharan Africa ($14.8M) to Kenya ($5.2M), Zimbabwe ($2.6M), Tanzania ($2.1M), Zambia ($1.6M), and South Africa ($817,430). Of these, South Africa, Zimbabwe, Zambia, and Tanzania are in SSA's top five importers of shelled groundnuts, representing potential for Malawi to further supply to these markets, specifically South Africa where current levels of export are limited by the quality of Malawian shelled groundnuts.

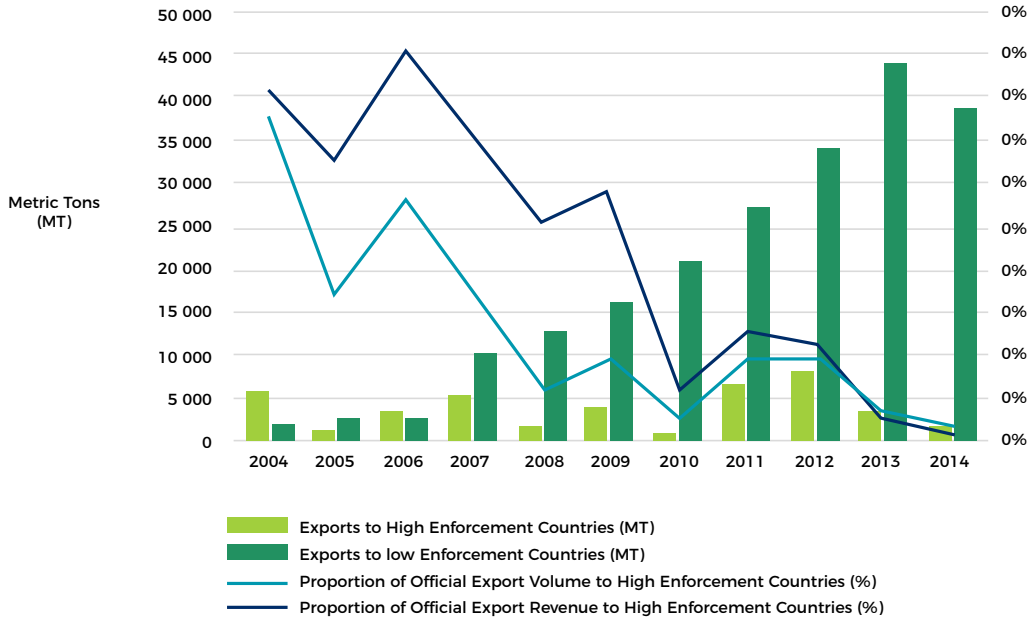
Malawi is not a major player in the trade of "in-shell" groundnuts, for which Senegal is the only SSA country in the top five exporters. In the category of crude groundnut oil, Malawi appears as the fifth largest exporter in SSA, but only makes a small contribution to Malawi's foreign earnings ($9,060, compared to Senegal's $23.7M or South Africa's $455,990).

While the above quantities represent Malawi's unfinished/raw groundnut exports, Malawi's main value-added (final good) exports for the groundnut value chain were to South Africa and included groundnut meal and peanut butter ($253,880), roasted or sweetened prepared groundnuts ($17,630) and mixed nut assortments ($89,840).

Insignificant quantities of Malawian groundnuts each international markets beyond Africa due to market various constraints and high levels of aflatoxin contamination[175, 176]. Of the top regional markets Malawi exports to (namely Zambia, Tanzania, Kenya and Zimbabwe), all have laws setting maximum aflatoxin limits yet only Kenya has the capacity to test for aflatoxins at its borders, and enforcement is found to be low[177]. The World Bank estimates that the European Union tightening regulations on aflatoxins cost African countries $670M in annual export losses of cereals, dried fruits, and nut, including groundnut[178]. Figure 6 displays the discrepancy between groundnut exported to high-enforcement countries versus those bought by low-enforcement countries.

In Figure 40, Zambia, Tanzania, Kenya and Zimbabwe are considered to be low-enforcement countries, while South Africa, European Union member states (as of 2014), and all other importers are categorised as high-enforcement.

Figure 40: Malawi's groundnut exports to high and low enforcement countries



Source: Edelman and Aberman (2015)[179]

4.1.2. Value Chain Actors and Status

Value addition and actors

Several different products, with varying levels of value addition, can be created from groundnuts. Table 68 outlines various products categorised by their level of processing.

Table 68: Value-added products in the groundnut value chain[180]

	Groundnuts
Raw/Semi-Processed	120230, 120241, 120242 Groundnuts; seed or not seed, roasted or otherwise cooked, whether or not shelled or broken
By-product	230500 Oilcake and other solid residues resulting from the extraction of peanut (groundnut) oil, whether or not ground or in the form of pellets
Medium value-added	200819 Nuts; groundnuts, whether or not containing added sugar, other sweetening matter or spirit 150810, 150890 Groundnut oil and its fractions, whether or not refined, whether or not chemically modified
Higher value-added	200897, 200899 Fruits, nuts and other edible parts of plants; prepared or preserved, whether or not containing added sugar, other sweetening matter or spirit 200811 Nuts; groundnuts, whether or not containing added sugar, other sweetening matter or spirit

Most groundnuts are traded through an underdeveloped and informal market system. Very few manufacturers or large traders engage farmers in formal contracts/arrangements for the purchase of their groundnut crops. The Government of Malawi attempted to remedy its grain marketing troubles by establishing two commodity exchange markets known as the Agriculture Commodity Exchange for Africa (ACE) and Auction Holdings Commodity Exchange (AHCX), but these have been highly unsuccessful; less than 1% of groundnuts are sold through these exchanges. In 2016, 166 tonnes of groundnuts were traded through official commodity exchanges, representing 0.17% of the total quantity of groundnuts traded in that year (96,275 tonnes).[181]

Relevant actors in the groundnut value chain include:

- **Input suppliers:** Upstream actors provide inputs to aid in the production of groundnut. For example, smallholders purchase seed at full or subsidised prices from companies, agro-dealers, recycling from other farmers, traders, NGOs, research stations, and government projects.[182] Seed organisations and companies include SEEDCO Malawi, MONSANTO, DEMETER, PANNAR Seed, Farmers World, and the National Smallholder Farmers' Association of Malawi (NASFAM). Membership-based organisations such as the ASSMAG (Association of Smallholder Seed Multipliers Action Group) exist and provide groundnut seeds to paying members.[183]

  Prior to the mid-1980s the Agricultural Development and Marketing Corporation (ADMARC), a state-owned statutory corporation, was the sole supplier of inputs and buyer of groundnut produce. The number of agro-dealers has increased since ADMARC lost its monopoly in the 1980s. Citizens Network for Foreign Affairs (CNFA/Rural Market Development Trust) and AGRA funded an agrodealer project to improve the network of agro-dealers and fill the gap left by ADMARC. Notable agro-dealers now include NASFAM, Kulima Gold, Farmer World, Agriculture Trading Company (ATC), and others.[184]

  Financial institutions are also tied into the value chain, as capital is an important factor in financing inputs. In this sense, FIs are upstream suppliers of financing for the groundnut value chain;

- Smallholders: Smallholder groundnut farmers, characterised by small land plots and low levels of input and modernisation, produce groundnut. Some smallholders organise into groups, with several groups forming a club and several clubs forming a larger association.[185] Over 93% of Malawi's groundnuts are produced by smallholders (with the remaining 7% produced by estates). As of 2013, out of 100,000 surveyed groundnut farmers, only 15,000 operated in groups/associations, leaving 85% of the smallholder farmers unorganised.[186] Many if not all of these farmers intercropped groundnuts with other staple and cash crops, namely maize.
- **Traders/vendors:** Transient traders/vendors, who buy directly from smallholder farmers at farmgate prices during the harvest season of April to early June, dominant the informal market. They also act as middle-persons between producers and processors/retailers in the formal market. Traders include vendors, retailers, wholesalers, and individual households or fellow farmers. Nzima et al. surveyed farmers and traders to determine that around 85% of farmers sell their produce to traders; about 60.9% of farmers sold their produce to vendors, 22.6% to wholesalers, 7.0% to retailers and 7.0% to fellow farmers. 29.6% sold groundnuts to consumers at designated government markets.[187]

  Many traders bought and sold groundnuts in addition to other agricultural and non-agricultural products. The most common crops traders dealt in were maize, pigeon peas and beans, but this varies by location.[188] It was not uncommon for traders to also be involved in the sale or upkeep of farming machinery and processing equipment.
- **Large-scale traders and processors:** Some smaller scale vendors/traders then sell to large-scale traders and processors, in addition to companies such as Afri-Nut (a peanut plant financed and co-owned by shareholders from the commercial and development sectors, namely NASFAM, Twin, Ex-Agris, Cordaid, Humana and Waterloo Foundation, which creates Fair-trade peanut butter from the groundnuts). Several companies process groundnut into roasted nuts, blanched nuts, peanut butters, and as an ingredient in Ready to Use Therapeutic Foods (RUTF). These large processors receive 40% of the country's groundnut production, and 15% of this quantity is exported to South Africa and other regional buyers.
- **Retailers:** Formal retail shops including supermarkets and agro-dealers connect consumers to the groundnut supply chain. Whole-sale retail companies, which also sell to consumers, include ADMARC, Mulli Brothers Group, National Smallholder Farmers Association of Malawi, Farmers World, ExportTrading and Takondwa Company.[189]

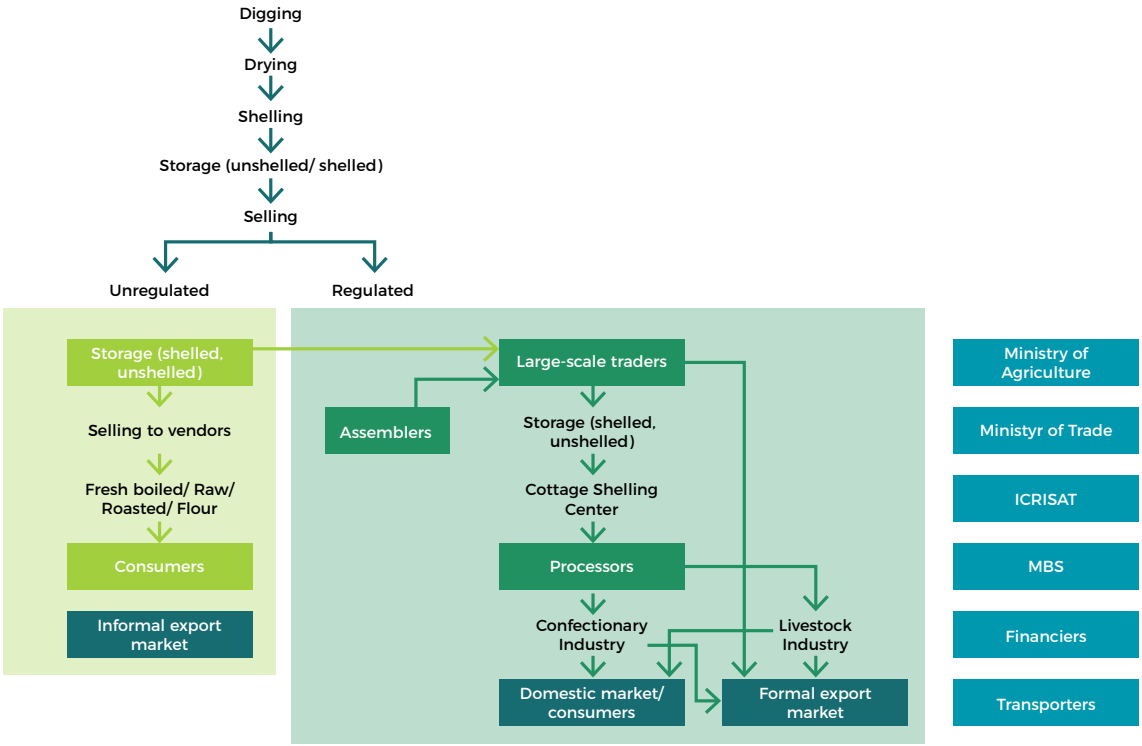
Nzima et al. (2014) identify five marketing channels for groundnuts involving the actors listed above. They are:

- Channel 1: Farmers sell groundnuts to vendors at a local market. Vendors then incur the costs of storing, transporting, and packaging for groundnuts to reach consumers.
- Channel 2: Farmers sell to vendors, who sell to retailers, who sell to final consumers.
- Channel 3: Farmers sell directly to retailers, who sell to individual consumers.
- Channel 4: Farmers sell groundnuts directly to consumers.
- Channel 5: Farmers sell to wholesale-retail companies that in turn sell to consumers.

Value chain mapping

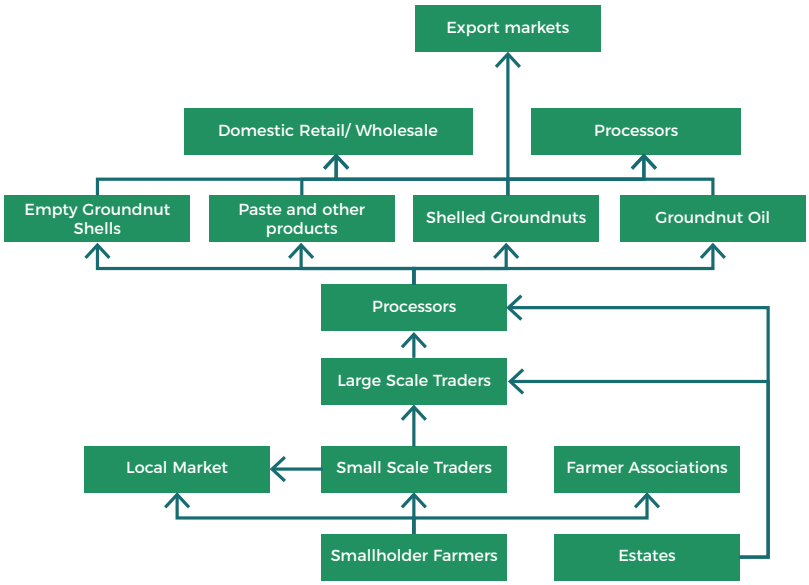
The following value chain maps illustrate potential paths for groundnut production and marketing, indicating both the unregulated (informal) and regulated (formal) avenues.

Figure 41: Groundnut value chain map



Source: FAO (2018)[190]

Figure 42: Simplified groundnut value chain map



Source: USAID (2014)[191]

The informal selling, depicted by the leftmost column of the value chain map of Figure 42, is most prevalent. This map also lists the production stages of harvesting groundnuts, which are digging, drying, shelling and storage. These activities are relevant when considering the quantity and quality of groundnuts produced, as well as in targeting approaches for nut marketing and safety.

Pricing and market factors

Table 69 displays the prices and value addition (percentage price change) for products at various stages of the value chain. As indicated, prices increase as value is added down the value chain, with more 'high end' groundnut products like peanut butter and RUTFs garnering the highest prices per kilogram and some of the highest profit margins.

Table 69: Price changes along the value chain

	Farmer	Trader / Vendor	Retail	Processor				
				Cooking Oil*	Nsinjiro**	Roasted Nuts	Peanut Butter	Sibusiso***
Avg raw / processed groundnut prices (MK/kg)	440	620	1,500	1,600	1,780	2,347	3,430	4,170
% price change	Base	41%	141%	14%	27%	32%	45%	22%
Farmer to Processor		240%	264%	305%	433%	480%	848%	

*Price of cooking oil for a one litre bottle. **Nsinjiro is a groundnut flour used as a condiment in local dishes; 60% of total production is consumed in the form of Nsinjiro. **Sibusiso is a form of therapeutic supplementary food product.

Some traders gain profits by reselling groundnuts for higher prices during the 'lean season' of October to March despite not adding any new value.[192] A lack of structured markets, production being limited to a season, and the informal trade have led to high price variability between prices at the farmgate and lean season prices; lean season prices can be twice as high as farmgate prices, and a year of suboptimal harvests can cause even higher lean season prices.[193]

The unstructured market, as well as lack of trader-based organisations or marketing groups to affect bargaining power, leads price to be determined on an individual basis. Surveyed traders indicated that the determination of prices in groundnuts markets depends on demand (58.2%), transport cost (56.7%), quality assessed by maturity and grading (26.9%), and purchase price (20.9%).[194]

The average farmgate price is around MK440/kg. The gross return on investment for farmers selling at this farmgate price and producing an average yield (~600 kg/ha) is around MK20,056/ha. If farmers are able to produce at 2,500kg/ha and sell at the same MK440/kg price, gross return on investment increases to MK856,056/ha. When farmers travel to local markets for sales, both road infrastructure quality and distance become highly significant. Bocher and Simtowe (2017) found that each one additional kilometre from the local market is associated with a 25% loss in profit efficiency.[195] The mean actual profit for farmers living less than 2km from the local market was MK11,053 compared to MK6,106 for those living more than 2km away from the local market.[196]

In terms of profit efficiency, access to extension services, larger household size, and soil are positively associated with efficiency. Distance from homestead to market and size of land allocated to groundnut production reduce efficiency. Male-headed households are six percent more efficient than female headed households on average. A 2017 study identified potential for increasing groundnut profitability by up to 55% through access to extension services and markets.[197]

4.1.3. Capital and Financial Services

The average farming household spent, on average, MK17 and MK50 on fertiliser and seed respectively each year.[198] Additional costs for smallholders include labour (although much of the harvesting and shelling labour for groundnuts is sourced from household members, primarily women) and storage. Downstream actors, particularly aggregating traders, processors, and marketers have additional costs; costs tend to vary based on the attention to quality

and aflatoxin contamination. It remains more expensive to produce and store low-aflatoxin groundnuts.

USAID (2014) notes that when considering access to credit and financial services, it is crucial to think of a farmer who produces groundnut not only as a groundnut SME, but as an SME owner with a portfolio of different crops. This is also crucial when considering access for traders/vendors and processors who typically deal in several different products/businesses.[199]

According to a 2012 survey conducted by USAID, approximately 40% of small enterprises had borrowed money for day to day needs and business growth at the time of the survey or in the previous year. Data show that these loans were concentrated in urban areas — only 11.7% of rural Malawians took out loans in 2017. Interviewed SMEs and smallholders indicated that they were three times as likely to borrow from a business associate or friend than from a bank; only 40.3% of 2017 loans were acquired formally through banks.[200]

Based on anecdotes, it was possible for farmers to borrow up to MK 500,000 (US $1,250) from an individual friend or business associate for a month with no interest, so long as the borrowing was reciprocal in times of need. This arrangement saves cost and also provides immediately available funds. Further, around one third of SMEs in the survey would not entertain borrowing from a financial institution due to fear of losing their assets.[201]

Institutions for microfinance loans (micro-finance institutions, or MFIs) include Concern Universal Microfinance Operations LTD (CUMO), Foundation for International Community Assistance (FINCA), Malawi Union of Savings and Credit Cooperatives (MUSCCO), Micro Loan Finance, and Malawi Rural Finance Company (MRFC). Many farmers have benefitted from these institutions, but many more are deterred from accessing loans due to high interest rates. Village Saving and Loan (VSL) Groups provide modest, pro-poor loans in villages, but their scale is limited.[202] Most of the MFIs are concentrated in Malawi's three largest cities, despite demand for rural credit being in rural areas. MFI expansion should cater to the 84% of Malawians who live and work in rural areas, including most groundnut smallholders.

Despite relatively low numbers, financial inclusion (FI) is increasing in the country. According to the 2017 Finscope Survey, FI was up to 54% in 2014 from 45% in 2008, but these increases were predominantly in Lilongwe, Blantyre and Mzuzu. Around 16% of rural living people use informal financial management mechanisms as compared to 6% in urban areas.

4.1.4. Environmental Factors

Groundnut typically has a more positive impact on both health and the environment compared to Malawi's leading cash crop, tobacco, largely because deforestation is not common in the production of groundnut. Legumes like groundnut can have a net positive impact on land by fixing atmospheric nitrogen in soil, therefore increasing soil fertility and lessening the need for inorganic fertilisers. In addition to lower fertiliser, groundnut also requires low quantities of water and is rarely grown with irrigation.

Despite a potential positive impact on the content of soil, poor land management practices have detrimental effects on land's growing potential. Over cultivation or continuous cultivation on a single piece of land leads to soil erosion and decreased soil quality. Cultivation in unsuitable areas (such as riverbanks, steep slopes, or ridges), the burning of residual crop materials, and lack of attention to soil's needs lead to increased surface run-off, the destruction of important catchment areas, and soil erosion. These poor management strategies lead Malawi to lose approximately 20 tons of soil per hectare per year.

The Government of Malawi has adopted policies to mitigate the risks of climate change, including the Environmental Management Act (EMA), National Environmental Policy (NEP), the National Environmental Action Plans (NEAP), and National Adaptation Plans of Action (NAPA). A Climate Change Policy is currently under development.[203]

4.1.5. Institutional Framework

Government interventions

The Ministry of Agriculture, Irrigation and Water Development (MoAIWD) is the primary institution overseeing groundnut activities. Its three technical departments are the Department of Agricultural Research Services, the Department of Crop Development (DCD) and the Department of Agricultural Extension Services (DAES). The Pesticide Control Board (PDCB) and the Department of Environmental Affairs (DoEA) monitory the safety of inputs for groundnut growth and control.

The Malawi Bureau of Standards (MBS) is responsible for standards development and quality assurance testing for goods and services, including creating safety protocols around groundnut contamination. It conducts periodic inspections of the domestic market and carries out mandatory testing for similar goods entering Malawi, an activity carried out under the Import Quality Monitoring Scheme (IQMS).[204]

The production, processing, marketing and sale of groundnuts are governed by several laws/ pieces of legislation in Malawi. These include:

1. **Special Crops Act:** Groundnut appears as a 'special crop' under the Special Crops Act (SCA), legislation first passed in 1963 with the specific objective of developing and marketing special crops. The SCA establishes the Special Crop Authorities and gives the Minister of Agriculture broad permission to intervene in the market whenever "the Minister is satisfied that the development of any crop should be promoted or fostered" and is a powerful tool for diversification of crops. Once a special crop, like groundnut, is declared, any individual or firm involved in producing, processing, marketing or exporting the crop may also be subject to new licensing requirements. Occasionally the licenses set technical standards for processing and accounting of special crops. At least eight other crops have been declared in addition to groundnut: cashews, coffee, cotton, macadamia, tea, tobacco, tung and flue-cured tobacco.
2. **Malawi Growth Development Strategy (MGDS) III:**[205] The third iteration of the Malawi Growth Development Strategies, which is the fourth medium-term national development strategy aligned to Malawi's Vision 2020 plan, is under implementation from 2017 to 2022. The strategy identifies five areas of focus: 1) agriculture, water development and climate change management, 2) education and skills development, 3) transport and ICT infrastructure, 4) energy, industry and tourism development, and 5) health and population. Developments in all of these areas are relevant to the production, transport, marketing and sale of groundnuts, and groundnuts are key to improving food security, nutrition, and livelihoods.
3. **National Agriculture Policy (NAP):** NAP, spanning 2016-2021, guides the agricultural sector with clear and comprehensive policy. Its specific objective is to lead Malawi in transformation of the agriculture setting. It encompasses eight key policy priority areas, which are: 1) sustainable agricultural production and productivity, 2) sustainable irrigation development, 3) mechanisation of agriculture, 4) agricultural market development, agro-processing, and value addition, 5) food and nutrition security, 6) agricultural risk management, 7) empowerment of youth, women, and vulnerable groups in agriculture, and finally 8) institutional development, coordination and capacity strengthening.

In addition to laws and strategies passed by parliament, there are also several policies carried out by various ministries of the government, particularly MoAIWD. These include:

1. **Farm Input Subsidy Programme (FISP):** FISP names groundnut production as a national priority, specifically in regard to increasing income and self-sufficiency for poor households. The programme has been implemented since 2005/2006 and has enhanced food security in the country. For the 2018/2019 growing seasons, FISP concentrated on maize fertiliser, cereal seed (maize, rice, sorghum) and legume seed (beans, groundnuts, pigeon peas, soya beans, cowpeas).[206]

2. **Sustainable Agriculture Production Programme (SAPP):** The Government of Malawi, supported by development partners, has initiated multiple policies to promote sustainable agriculture and the conservation of water and soil. A notable policy is the Sustainable Agriculture Production Programme (SAPP) is implemented by the Ministry of Agriculture, Irrigation and Water Development (MoAIWD), with support from IFAD. SAPP focuses on simple and affordable good agriculture practices (GAPs) to protect the environment and improve agricultural productivity.[207]
3. **Extension Services:** Extension services are provided by the government as well as other private actors (e.g. CadeCom, Limbe Life, IRLAD) through various projects with funding from GoM, multilateral funders, non-profits, and even corporations.[208]

Private sector and NGO interventions

Non-profit and non-governmental organisations are involved in the groundnut value chain with foci on improving livelihoods, crop diversification, increasing household income generation, and mitigating the risks of climate change, among others. To address upstream activities, organisations including Concern Universal, CARD, Plan Malawi, World Vision International, Oxfam, Action Aid, NASFAM and many others provide free or affordable seed and provide agricultural training and extension services.[209] Many NGOs and CSOs organise through consortiums and/or with district councils. Some recent and ongoing projects include:

1. **The Green Innovation Centres for the Agriculture and Food Sector (GIAE): T**he GIAE project, commissioned by the German Federal Ministry for Economic Coordination and Development (BMZ) and jointly implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Malawian Ministry for Industry, Trade and Tourism from 2014-2022, is an ongoing project addressing groundnut. GIAE seeks to improve production, productivity, and income for smallholder farmers, particularly women and youth. In addition to groundnuts, soybeans and cassava are targeted. The project comprises four foci: 1) increasing capacities of smallholder enterprises, 2) improving the business of up and down-stream enterprises, 3) strengthening of special interest groups, and 4) supporting the transnational knowledge exchange between value chain actors. As of 2017, over 7,000 smallholder farmers have been trained in the business principles of farming for groundnut and soybean in partnership with private sector companies and an association of smallholder farmer organisations.[210]
2. **KULIMA — More Income and Employment in Rural Areas (MIERA):** Groundnut was featured as a selected value chain market, along with soybean, rice, cassava, sunflower, paprika/chillies, and macadamia, in the MIERA project (2015-2019). Commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the European Union (EU), MIERA used a value chain approach to support smallholders and MSMEs, particularly in downstream portions of the value chain (processing, marketing). The chief objective was to create more rural employment for smallholders and MSMEs, with a particular focus on female inclusion. Business training and market linkages also feature prominently. Results have included over 900 jobs created; 21,000 smallholder farmers reporting an income increase; more than 400 marketing and contract farming agreements signed between partner companies and farmer organisations, linking farmers directly to better output markets and increasing their access to improved inputs and extension; 22,000 smallholder farmers trained on farm economics, agribusiness and marketing skills and introduced to new farm business management practices such as record keeping or gross margin analysis; and 350 MSMEs participating in the MSME Business Training and Coaching Loop to learn about better processing, business and marketing opportunities, and subsequently tapping into new retail markets for value-added products.[211]
3. **Afri-Nut:** Afri-Nut provides an interesting case study on a market intervention implemented between the private and development sectors. Afri-Nut acts as a "specialised groundnut processing and distribution marketing business" with the goal of integrating Malawian smallholder groundnut producers across the value chain and expanding the

volume and value of Fairtrade and value-added groundnuts.[212] The partnership (between NASFAM, AgDevCo, Twin Trading, Cordaid, Humana, the Waterloo Foundation, and formerly Ex-Agris prior to its liquidation) purchases from independent smallholders and associations at fair prices and creates high quality goods then marketed to consumers. [213]

One of the most relevant organisations is The National Smallholder Farmers' Association of Malawi (NASFAM). Funded by the United States Government, NASFAM was established in 1955 to support smallholder agriculture, specifically tobacco. NASFAM now facilitates trade for several different crops including groundnuts, and sells groundnut products in supermarkets under its brand name.[214]

Research and academic institutions

In-country research entities, such as the Department of Agriculture Research, Lilongwe University of Agriculture and Natural resources (formerly Bunda College of Agriculture), and the International Crops Research Institution for the Semi-Arid Tropics (ICRISAT) have national and global mandates on groundnut research. They also conduct training and outreach. Many of these programs are organised under/governed by the Department of Agriculture.[215]

4.2. Constraints and Potential for Growth

4.2.1. Current Constraints

It is estimated that with interventions and better management practices, significantly higher yields could be achieved. Under ideal conditions, CG7 could produce a maximum yield of 2,500kg/ha, Nsinjiro 2,000kg/ha, and Chalimbana 1,500kg/ha (as compared to their current yields of 1,000kg, 1,000kg, and 600kg respectively).[216] If current constraints are addressed, groundnut has great potential, particularly because it requires lower labour input than other crops;[217] groundnuts have the highest export value promise of oilseed crops in Malawi, and could bring $55.9M -- yet 25% ($25.2M) of this potential goes unrealised.[218]

Aflatoxin content

The presence of aflatoxins presents a huge constraint on Malawi's groundnut growth and export. Malawi experiences an average of 6,344 deaths annually due to aflatoxin-induced liver cancer, costing the economy more than $25M per year. While groundnut exports have increased significantly in recent years, the value of exports is constrained based on which regions and countries are willing to buy Malawian groundnuts without undergoing basic or extensive aflatoxin screening.[219] European markets imposing more strict Maximum Allowable Levels (MALs) of aflatoxins has decreased Malawi's foreign earnings from groundnut, and South Africa is another country with relatively stringent screening.[220, 221]

Informal markets for exports are highly unlikely to test for aflatoxins, explaining in part why Malawi has been unsuccessful in increasing the share of groundnuts traded through formal exchanges as opposed to informally and without documentation. During the period 2010-2014, Malawi exported a total of 273,000 tonnes of groundnut, yet only seven percent of these were exported to high enforcement destination markets like South Africa or the EU. This leaves a huge untapped potential for exports if Malawi is able to improve the safety of groundnut production to avoid aflatoxin contamination.[222]

Most aflatoxin contamination results from poor farming and processing management techniques; sometimes groundnuts are sprinkled with water or even kept in water prior to shelling to soften the shells, which can increase the risk of aflatoxin contamination by around 73% when moisture increases fungal growth.[223] This process is deeply ingrained for smallholder farmers, as women typically do the painful and time-consuming task of shelling the nuts by hand. Hand-operated tools can increase the speed of shelling tenfold, and reduce the need to keep nuts wet before shelling.[224]

The costs of appropriate handling and risk management strategies required to reduce aflatoxin presence and meet the standards of high-value markets are expensive and minimise the price premium exporters are able to offer for low-aflatoxin groundnut. Aflatoxins have the risk of increasing during transit, and aflatoxin-infected groundnuts may be destroyed or even returned to the selling firm in Malawi at the seller's expense if the levels are found to be too high upon arrival. Thus, given the current level of aflatoxin prevalence, the risk outweighs the price premium.[225]

Farmers are disincentivised from investing in planting, harvesting, handling and storage practices to avoid aflatoxin contamination because they receive higher prices from exports (both informal and formal) who trade untested groundnut, thus avoiding the costs of complying with aflatoxin regulations. Even farmers trained in good post-harvest practices to avoid aflatoxin contamination have shown a preference to sell shelled nuts to informal traders at a higher price. To ensure only healthy nuts are produced, farmers must discard or grade-out around 25% of a harvest, so price premiums must be high enough to offset those losses.[226]

Recommendations have been made to address the challenges presented by aflatoxin contamination, such as providing catalytic matching funding to private sector partners creating innovative solutions to testing and management.

Lack of access to finance, and quality inputs and seed

Groundnut has a demanding seed rate (requiring 80 to 100kg of seeds per hectare) and a low seed multiplication ratio, making high quality and certified seed financially inaccessible to smallholder farmers. As a result, farmers use recycled seed and experience sub-optimal yields.[227] Recycling remains the most common source of seed acquisition (nearly 70% of farmers access seed this way).[228]

Even as farms grow in size and land holding, that growth is not necessarily associated with higher output or profits. Bocher and Simtowe (2017) found that larger farms had lower efficiency, partially explained by diminished timeliness of inputs used and difficulties for larger farmers to operate with an ideal level of quality inputs. Larger plot sizes by hectare are also associated with lower efficiency.[229]This correlation underscores the importance of quality inputs and supports the argument that finance for and access to quality inputs ought to be prioritised for the value chain's development.

Quality inputs require not only access to loan-granting institutions, but also sufficient capital and finance. Even when savings and access to credit are available through small loans from financial institutions or Village Savings and Loans groups, the small value loans/injections of capital are often too small to access meaningful quantities of seed, fertiliser, etc, and highly unlikely to be large enough to make systemic infrastructural improvements (mechanisation, storage infrastructure, processing equipment).[230] Often, households obtain credit for the purposes of business start-up capital, medical costs, educational costs, purchase of food for consumption, and inputs for food crops.[231]

Underdeveloped formal markets

A culture of non-compliance to standards for quality and grading prevents farmers from accessing high value processing and export markets exists across the value chain. The underdeveloped groundnut sector has reduced in value and quality since the liberalisation of the market; prior to liberalisation, ADMARC enforced strict quality controls.[232]

Now less than 1% of traded groundnuts are marketed through the two commodity exchanges in Malawi. Underdeveloped formal trade channels for groundnuts lead producers to sell in informal village and roadside markets, associated with dangerous health risks, as aflatoxin contamination is higher when standards for post-harvest management are not enforced.

Informal selling also decreases quality and leads to loss of crops. Selling along roads exposes the groundnuts to excessive heat from the sun, resulting in over-drying and loss of quality. Nuts sold informally are often stored in pails or buckets and can be exposed to aflatoxins, pests, and chemicals.

Underdeveloped formal markets impact farmers' incentives to produce quality nuts through volatile pricing. Because farmgate prices are not subject to any price controls or regulation, they fluctuate greatly. Farmers who receive lower farmgate prices in one growing season will decrease investment in groundnut crops for the subsequent growing season, spending less capital on high quality inputs, reducing the area of land dedicated to groundnuts and using the space to cultivate alternative oilseeds or other crops, and reducing the attention given to post-harvest nuts.

4.2.2. Options for Growth

Improving yield and productivity

With limited excess land being available and suitable for farming, expanding the hectares allocated to groundnut production is not a viable solution. Instead, increasing land productivity and using resources more efficiently is critical to increase yields and qualities of ground nuts. The use of recycled seed and poor farming methods has compromised yields and increased aflatoxin levels. Promoting the access of higher quality seed through easier access to financing is key to the future, as is educating primary producers on the importance of using this quality seed and improving their general farming methods.

If current constraints are addressed, groundnut has great potential, particularly because it requires lower labour input than other crops; groundnuts have the highest export value promise of oilseed crops in Malawi, and could bring $55.9M -- yet 25% ($25.2M) of this potential goes unrealised.

Decreasing aflatoxin contamination is particularly relevant given that the share of exports to high-enforcement destinations (countries with strict limits on aflatoxin levels such as South Africa and the European Union) dropped from 21 per cent (2004 to 2009) to 7 per cent (2010 to 2014) over the last 20 years, and lower-value exports were directed to low-enforcement destinations such as Kenya, Tanzania, Zimbabwe and Zambia. Recently these historically low-enforcing countries are tightening regulations and may begin to reject Malawian aflatoxin-impacted nuts; after the establishment of the Partnership for Aflatoxin Controls in Africa (PACA), Tanzania (Malawi's largest importer of groundnut over the last five years aggregated) passed legislation limiting aflatoxins to 10 ppb and increased testing at borders.

A dual approach of improving farmers' management practices and improving the infrastructure for the safe transport and sale of post-harvest groundnut is necessary. Consumer awareness campaigns to educate on the risks of high aflatoxin consumption are important to increase demand for low-aflatoxin groundnut, thus creating higher price premiums to offset the extra costs and grade outs.. With current levels of access to profit and capital, smallholders will not be able to absorb the costs of controlling for aflatoxins; rather, the costs need to be distributed across the supply chain.

Edelman and Aberman (2015) recommend increasing tax incentives for exporters with ISO-certified facilities; currently groundnut exporters receive a 25% tax credit, which could either be increased for testing exporters or denied for exports who don't. Edelman and Aberman note that such a solution would signal to the international community that Malawi "cares about its reputation as a major regional groundnut exporter and is willing to invest in its brand" and is willing to participate in the regional effort to reduce aflatoxins in groundnut.

Extension services are highly effective in encouraging productivity and efficiency; Bocher and Simtowe's 2017 analysis discovered that despite only 5% of their respondents having access to extension services, those farmers generated 34% higher actual profit and were 20% more efficient than those without access to extension services. Nzima (2014) confirms this finding. Extension services prove to be a low-cost intervention with great benefits down the value chain. For example, many farmers suffer from lower yield and lesser oil content, preventing them from

selling to processors who can in turn produce high value-add final products, due to premature harvesting.[233]The simple remedy to this inefficiency is to educate farmers on best practices for harvesting, including the signs of maturity for groundnuts.

Developing new varieties

In order to unlock the price potential of finished groundnut goods, it is advisable for Malawi to invest in researching and developing new varieties of groundnuts in response to the preferences of the manufacturing industry and export markets. For example, varieties with higher oil content for the production of nut-based oils or varieties with higher protein and fibre content for nutrition/consumption.[234]

When deciding what varieties (existing or future) to cultivate, farmers ought to consider their price premiums and value in various markets; at present, an overwhelming majority of farmers expressed that they choose groundnut varieties based on biological factors, such as maturation period, rather than market factors and preferences.[235] For example, Malawi has excess capacity and infrastructure for crushing groundnuts into oil, but the oil subsector is largely dominated by sunflower seed and soybeans as they have higher oil yields than the varieties of groundnuts currently available. If an oil-dense variety were formulated, it could compete with sunflower and soy for a larger share of the oil market.[236]

Special attention ought to be paid to aflatoxin- and disease-resistant groundnut varieties, which can earn higher prices and reach higher-value markets. In 2017, an aflatoxin-resistant variety known as Crop Dehyee was developed and introduced in Ghana.[237]Similar solutions would be valuable in Malawi.

Expanding into new markets

Expanding into higher-paying markets such as South Africa or the EU will be contingent upon Malawi enacting safer growing and handling management strategies to avoid the presence of aflatoxins, as these markets will not be willing to import potentially dangerous groundnuts from Malawi. Malawi's groundnut prices are lower than the world prices, providing a competitive advantage (particularly for improved varieties).[238] Stakeholder conversations uncovered that an inherent challenge omitted from the literature is the unexpected costs of transport and trade of volatile crops such as groundnut; for example, if small-scale exporters pay a truck driver a daily rate to transport groundnuts over the border and then that truck driver experiences a three- or four-day delay crossing the border, these additional and unpredictable costs eat into the profit margins of the groundnut exportation.

Promoting the access of higher quality seed through easier access to financing is key to the future, as is educating primary producers on the importance of using this quality seed and improving their general farming methods.

Domestically, there is opportunity to increase the quantity of groundnut produced for industrial demand. Industrial demand currently absorbs 30% of total production and could potentially double or triple if farmers can produce consistent, quality groundnut year-round.[239]

Regionally, Malawi might consider expanding exports to Botswana, which was the second largest African importer of groundnut meal between 2013 and 2017. For prepared or roasted groundnuts, Angola, Botswana, and Mauritius, which were three of the five largest African importers of roasted groundnut 2013-2017 (along with South Africa, and Ethiopia which is geographically impractical due to the costs of transport).[240]

Structuring the informal market

Developing high value Nut in Shell (NIS) markets would 1) garner premium prices for farmers and 2) reduce the aflatoxin contamination caused by post-harvest handling practices. When groundnuts are bought and sorted in their shells through an NIS market, the post-harvest labour is greatly reduced, particularly for women and families on whom the task of shelling nuts typically falls. A 2010-2013 intervention study showed the efficacy of diversifying the groundnut trade by developing high value NIS markets.[241]

4.3 Potential Interventions by FinMark Trust

4.3.1 Most Significant Interventions Needed

Controlling Aflatoxin contamination

Aflatoxin contamination is the costliest flaw in Malawi's groundnut value chain, and poses the most direct threat to peoples' lives. Interventions to reduce aflatoxin content would have immediate impacts on the quality of groundnuts produced and subsequent prices earned, as well as preventing the diseases known to be associated with the intake of these toxins. Direct solutions might include financing the use of biochemicals that prevent the growth of aflatoxins (see below) or extension services to train producers on GAP to test for and avoid the harmful toxins. Indirect solutions will address farmers' access to capital to improve inputs (bacteria-resistant seed such as the aflatoxin-resistant variety Crop Dehyee developed in Ghana,[242] additional soil nutrients separate from nitrogen) and infrastructure (especially facilities for storage and transportation).

The avoidance of aflatoxins will largely be made possible by capital and finance, both at the smallholder level and for bringing new technologies into the country under research and pilot programmes. Improvements will benefit both the domestic market and unlock potential for higher-value trade internationally. Some experts predict that improving Malawi's groundnut quality will reflect well on not only this individual value chain but will also ensure international partners of the country's renewed dedication to the quality and safety of its agricultural outputs at large.

In addition to growing and transport practices, certain value-addition activities can reduce the prevalence of toxins; processing groundnuts into groundnut oil can help remove proteins responsible for aflatoxins through a simple filtration process after the oil is pressed, resulting in a nutrient-dense product to be sold in the value-added market.

The costs of aflatoxin management need to be disturbed across the supply chain as it is not sustainable for smallholders — the poorest segment of the value chain — to assume all costs.

Developing farmers' organisations

Farmers' organisations serving the groundnut value chain are currently underdeveloped, with NASFAM being the most prominent actor. Pyxus Agriculture Limited, a subsidiary of Pyxus International Inc, is closely associated with Phillip Morris International and was launched as an offshoot of Alliance One Tobacco in 2018. Its primary focus is the diversification of farmers away from tobacco. Being built on the back of the Alliance One's infrastructure, where there are well established contract farming, out-grower and smallholder support schemes and with the huge investment capital they are injecting, Pyxus are in strong position to lead the transformation of the groundnut and soya value chains in Malawi. They are particularly focusing on supporting actors previously engaged in the tobacco value chain to transition into other high value crops primarily groundnut and legumes.[243] With groundnuts their strategy is to grow production of groundnuts up to 200,000 tonnes in the next three to five years. Pyxus contracts farmers transitioning away from tobacco and purchase their agricultural cash crop outputs, then adds value and markets them to domestic and international markets. Upon contract, Pyxus also facilitates access to farm inputs and extension services, addressing issues of both low productivity and lack of market access through its interventions. Their well-established financing mechanisms would make them a potential partner for FMT to engage with to assist in crowing more tobacco farmers and other small holders into their supply chains.

These organisations and cooperatives are valuable in facilitating farmers' access to high quality inputs, better extension services, higher value and more formal markets, capacity building, and, importantly, credit. As more careful health and safety regulations are imposed,

such organisations will be instrumental in disseminating information, sharing resources, aiding access to necessary inputs and infrastructures, and incentivizing value chain actors to participate in the formal market.

Similarly, organisations are viable options for traders and processors and are expected to have the same positive effect on. At the present, Nzima notes that a majority of groundnut and soybean traders (88.1%) operated their businesses as sole traders, with only 9.0% working in partnerships and only 3.0% operated as companies. This disjointed trader economy fails to foster the exchange of best practices for safety and business, and an association or cooperation of traders could have better success.

Financial needs

As in other value chains, groundnut farmers and other actors suffer from a lack of agriculturally focused financial services and a lack of segmentation of the market. See section "Agricultural Finance in Malawi" for an overview of Malawi's financial landscape.

4.3.2 Scope for Synergies with Interventions by Other Role Players

Post-harvest loss management framework

Given that aflatoxin contamination presents the most notable limitations to the groundnut sector, it would be advisable for FinMark Trust's interventions to synergize with existing efforts towards aflatoxin reduction. The post-harvest loss management (PHLM) framework is a key guiding principle focusing on improving the productivity of useable groundnuts and reducing the portion that needs to be graded out due to low quality.

FAO notes that "as a product moves along the chain, losses may occur from a number of causes. These losses fall into three main categories: (i) quantitative or physical losses which cause a loss in weight of the product; (ii) loss of quality which changes the appearance, taste, texture or nutritional value of the product; and (iii) loss of opportunity for value addition to the product." FAO also states that in Malawi, interventions targeted at reducing PHL are likely to be "much more cost-effective" than investments in additional production — further, "The marginal environmental cost of qualitative and quantitative saving through improved post-harvest techniques is generally much lower than trying to reach the same value through additional production."

In addition to increasing direct revenue from groundnuts PHLM activities also generate on- and off-farm employment, increase rural income, reduce rural exodus, increase value addition, and improve competitiveness. Post-harvest activities increase public revenues directly through revenue taxation and indirectly through VAT.

The Partnership for Aflatoxin Control in Africa (PACA) is a strong example of an Africa-wide intervention that includes PHLM. PACA is an "innovative consortium with the overall aim of supporting agricultural development, safeguarding consumer health and facilitating trade by catalysing, coordinating and increasing effective aflatoxin control". Malawi's initiative aligned with PACA, known as the Malawi Programme for Aflatoxin Control (MAPAC), is dedicated to seeking Malawi's capacity to control and reduce aflatoxin contamination. Activities include research, introducing good practices, developing testing capability in laboratories, and promoting key policies. In addition to the Malawi Bureau of Standards (MBS), a second laboratory has been established at the Chitedze Agricultural Research Station (CARS) for the analysis of mycotoxins, which provides reputable and reliable aflatoxin testing to processors and exporters. MAPAC was developed under a scoping study funded by the WTO Standards and Trade Development (STDF).

The International Crops Research Institution for the Semi-Arid Tropics (ICRISAT) is currently piloting the use of biocontrol agent known as "Alfasafe," which curbs the growth of harmful aflatoxins by 80-100% with just one application per growing cycle, across the world including on the African continent. Aflasafe keeps groundnut free of aflatoxins in both the growth and post-harvest stages, reducing post-harvest loss. Aflasafe has performed well in other SSA countries and will be commercialized following its pilot period, funded in part by USAID, in Malawi. When farmers spread 10kg of the formula per hectare of land 2-3 weeks before the crop flowers, the combination of nontoxic fungal spores in Aflasafe spread through the field and establish themselves before any other (harmful) fungal strains can develop, including those which produce aflatoxin. The formula includes four strains of 'friendly' fungal strains, as well as sorghum powder which acts as both a spreading agent and a food source for the living fungi spores. Once the crops flower, and eventually produce seed in the case of groundnuts, the fungi move to occupy the flowers and seeds, too, preventing any other strains from surviving. Aflasafe continues to protect food crops beyond harvest and through transport, storage, and consumption.

Another viable solution developed by ICRISAT is a low-cost aflatoxin testing kit aimed at making aflatoxin testing more affordable and accessible. To be sure, the prevention of aflatoxin development is a more effective choice than creating testing mechanisms to grade out any aflatoxins that do develop. However, given the challenges associated with spreading anti-aflatoxin technologies widely and the immediate danger caused by these toxins, testing remains a highly important measure to be adopted in conjunction with measures to reduce presence totally.

5. SOYBEANS

5.1. Current Status of the Soybean Value Chain

5.1.1. Primary Production

Geographic growth and productivity

According to government records, soybean has been cultivated in Malawi since 1909 and is produced throughout the country.[243] The country's agro-ecology exhibits distinct agro-ecological zones (AEZ): tropical highlands escarpment and plateaus, semi-arid lowlands and sub-humid lake areas.[244] The majority of the Southern Region is classified as tropical: warm/semi-arid, with patches of tropical: cool/semi-arid in the south-west, reflecting an average increase in altitude through escarpments towards the western plateau (i.e. bordering north-west Mozambique). In contrast, lakeshore and central-east areas are classified as tropical: warm/subhumid. Further north and west, areas are classified as tropical: cool/subhumid, again reflecting an increase in altitude and plateau.[245, 256]

These variances are used to inform national development planning agendas, as they can have significant impacts on growing conditions: local climates, water resources, as well as soil formation and vegetation patterns.[247] Therefore, cultivation periods differ significantly, as average rainfalls vary through different parts of the country, offering between 60-119, 120-179, and 180-269 days growing period for semi-arid, dry subhumid and moist-subhumid, respectively (see Table 70 and Figure 43 below).[248] In many areas, a lack of water availability can be intensified by rainfall deficits coupled with high evaporation rates. This greatly constrains rainfed agricultural production.[249] Semi-arid areas are particularly vulnerable to fluctuations in climatic conditions, experiencing the coupling effects of frequent, seasonal droughts and floods. This climate risk, coupled with limited technological advancement nor innovation and technical expertise limit productivity and heighten food insecurity for subsistence and small-scale producers.[250] This therefore dictates the farming systems that can be viable for producers.[251]

The majority of soy producers use rainfed systems. The below table illustrates the crop's requirements for rainfed systems: both unimproved and improved traditional management methods, based on spatial assessments of land, soil, and climate suitability for the crop's production in Malawi.[252] Optimal exploitation of cultivatable land depends largely on pre-existing and improved soil fertility through management, as well as the ecological sustainability of conditions. The below table shows the ability of soils in Malawi to retain and supply nutrients and water to enable optimal soy crop cultivation. When conditions fall outside of these critical ranges, optimal crops yields cannot be expected without improved management practices.[253]

Climatic and agronomic conditions throughout the country are favourable but not optimal for growing soybeans. As shown in Table 70, and illustrated in Figure 43 below, very few areas offer highly suitable areas for cultivation. Though soy can grow on a variety of different soil types (both light sands and heavy clay) it requires large amounts of water, either from rainfall and sufficient soil retention or irrigation. Most areas are therefore deemed less suitable, largely due to water scarcity. As shown in Figure 43, many areas offer moderately and marginally suitable growing conditions.

Though soy can grow on a variety of different soil types (both light sands and heavy clay) it requires large amounts of water, either from rainfall and sufficient soil retention or irrigation. Most areas are therefore deemed less suitable, largely due to water scarcity.

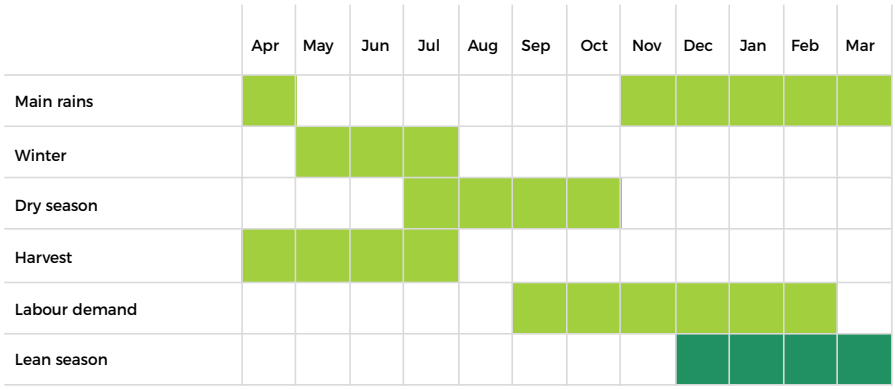
Table 70: Soybean crop suitability when produced in Malawi under improved and unimproved traditional management practises

Crop Requirements	Improved traditional management	Traditional management
Maximum yield, MT/ha	2.0	1.0
Mean daily temperature - range, °C	18-32	°C 18-32
Mean daily temperature - optimal, °C	22-27	°C 22-27
Growing period - range, days	105-300	105-300
Growing period - optimal, days	150-240	150-180
Drought resistance	low	low
Soil texture - range	coarse to fine	coarse to fine
Soil texture - optimal	medium to fine	medium to fine
Soil depth - range, cm	>30	>30
Soil depth - optimal, cm	>60	>60
Soil drainage - range	imperfect/ somewhat excessive	Imperfect/ somewhat excessive
Soil drainage - optimal	moderately well to well	moderately well to well
Soil fertility requirements	High	High
Soil reaction - range, pH	5.0-8.5	5.0-8.5
Soil reaction - optimal, pH	6.0-7.5	6.0-7.5
Salinity tolerance - range, mmhos/cm	<8	<8
Salinity tolerance - optimal, mmhos/cm	<6	<6

Source: Adapted from Benson, et al (2016)

Most farmers rely on rainfed systems for agricultural cycles: dependent on either the main rains or secondary rains to supplement irrigation. Therefore, production is largely tied to the seasonal calendar below. The production cycle falls in line with the traditional seasonal calendar shown in Figure 43 below. The onset of the rains is key for agricultural production, particularly for soy. In a typical year, the months between May and October are dry, with minimal rainfall. Temperatures fall Apr-Jun and begin to rise again towards the onset of summer (Sep-Oct). From September to February when most crops are being produced (particularly rain-fed crops), there is a high labour demand (see Figure 43) and an opportunity for household members to engage in non-agriculture income generating activities where possible (e.g. trade, manual labour etc). Reliance on such activities will be determined by the wealth status of the household for any given year.

Figure 43: Seasonal calendar for Malawi

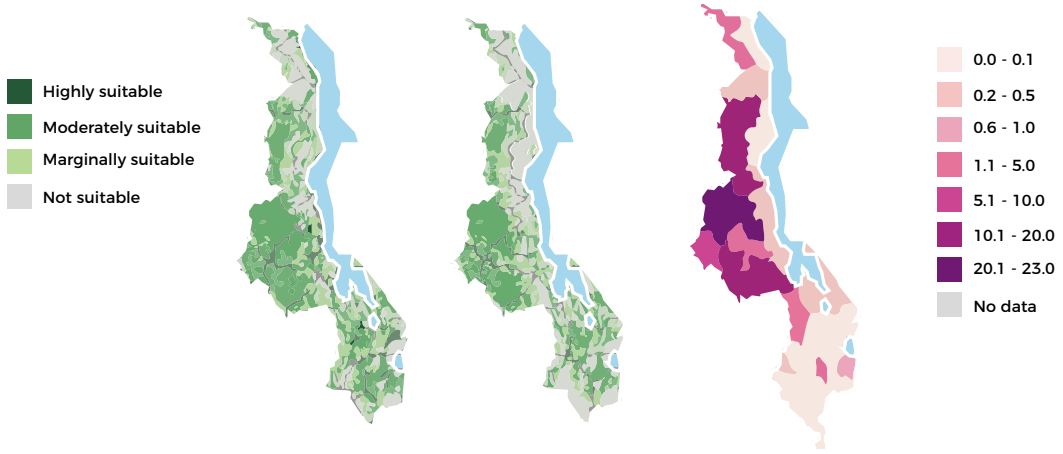


Source: USAID (2015)[254]

The seasonal calendar varies somewhat by AEZ (i.e. district/region). Farmers must prepare the land before the onset of the rains (August to October) and the main harvest starts in April, ending in June. Crops are then sold into September. In some areas, a second, shorter, irrigated season begins towards the end of the initial rainfed crop. Providing there is access, producers will grow soybeans alongside other crops like maize in low-lying areas in which moisture is retained (known locally as 'dimbas'). These areas are supplied with water during the initial, main rain season. As this second harvest arrives before the lean season it is highly valuable for the nutritional security of households. [255]

Figure 44 illustrates the suitability of different geographical areas for soya produced under rainfed cultivation with both improved traditional management (left) and unimproved management (right). Due to its suitability, the majority of production occurs in the country's Central Region.[256] The western plateau accounts for >50% of the country: from the Southern-Central Region border to the Central-Northern Region border. With elevations ranging between 750-1,300 metres above sea-level, the western plateau is renowned for soybean production and is home to the three highest producing districts: Kasungu, Lilongwe and Mzuzu (see Figure 44 – right).[257, 258]

Figure 44: Map of soy crop suitability under rainfed cultivation, with improved (left) and unimproved management (middle) and production by district (right)



Source: Adapted from Benson, et al (2016) and Pauw, et al (2015)[259, 260]

In addition to rain, sufficient soil nutrients are important for growth and yield. For soybean, as for many other crops, phosphorous is one of these key nutrients. Low phosphorous levels can limit yields, as it has a generally high crop demand for phosphorous as compared to other nutrients; in contrast, soybean is able to grow with the nitrogen available in the soil, through the process of nitrogen fixation, without requiring additional inputs. Socioeconomic constraints preventing smallholders from accessing phosphorous dense inputs, combined with poor soil quality and degradation, lead to insufficient phosphorous and lower yields. Soybean also has a relatively high phosphorous harvest index, with up to 80% of uptake allocated to grain. Replenishing phosphorous absorbed by soybean grain harvest (achieved through the addition of phosphorous inputs) is essential for agroecosystem sustainability. When soils are well managed and provide sufficient phosphorous for soybean, nitrogen fixation is maximised and can increase grain yield.[261]

As shown in Table 71 below, Malawian producers typically use three soybean varieties: Makwacha, Nasoko and Tikolole. A further three are cultivated in limited areas, largely due to seed availability: Ocepara-4, Solitaire and Soprano.[262] Some experts note that the three primary varieties are not used in their ideal agro-ecological conditions.[263] This has led to the trialling of different varieties, through various research and development programmes that involve trials

at various government-owned research stations.[264] New varieties have been introduced due to their drought and disease resistance and trials have attempted to evaluate their summer and winter production figures (i.e. to account for rainfed and irrigated cropping systems respectively).

Table 71: Characteristics of soybean varieties currently grown in Malawi

Variety	Origin	Special varietal attributes	Recommended agro-ecologies	Yield potential
Makwacha	Zimbabwe (2003)	Cream/white hilum, large seeds	Medium to high-altitude areas	3000
Nasoko	Zimbabwe (2002)	Cream/white hilum, large seeds	Medium to high-altitude areas	3000
Tikolore	IITA (2011)	Early maturing	Low, medium & high-altitudes	2500
Ocepara-4	USA (1993)	Nematode resistant	Medium altitude areas	2500
Solitaire	Seed Co (2003)	High yielding, tolerant to frogeye	Widely adapted to most AEZ	3000
Soprano	Seed Co (2003)	High yielding, tolerant to frogeye	Medium to high-altitude areas	3000

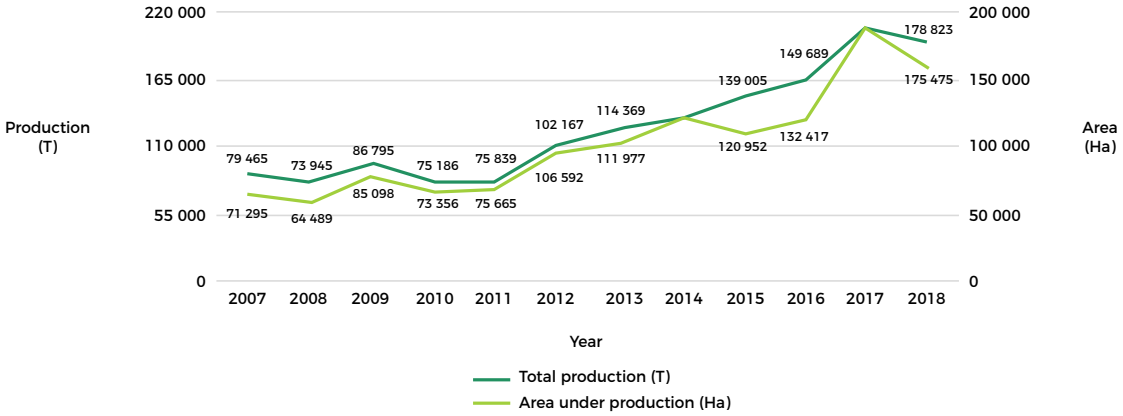
Contribution to grow value of agricultural output, employment, and incomes

Agriculture is a key contributor to Malawi's economy, accounting for approximately 39% of the country's GDP (approximately USD 7 billion),[265] 85% of employment and over 90% of foreign exchange earnings.[266] Within this, the total value of the Malawi soy market is approximately USD30 million, contributing <0.01% of the country's GDP.[267] The crop is of high importance to producers, owing to its market value (typically high prices), and versatility: either monocrop single stand or rotated with other crops. In recent years, soy has offered a viable replacement or transitionary crop for tobacco farmers: the primary cash crop for >250,000 smallholder farmers.[268] Smallholder farmers are the primary growers, accounting for >90% of total production.[269] For these actors, soy is considered primarily as a cash crop for sale, and therefore only small quantities are consumed directly by farming household or fed to farm livestock.[270]

As shown below in Figure 45, on average, annual soy production has witnessed an increasing trend over recent years. This has largely been due to the increase in production area (hectares under production) as more producers move to include soy as an alternative cash crop to tobacco, rising by >200% in recent decades.[271, 272] The increasing trend between 2011 and 2016 can also be attributed to changes in public policy tied to increasing pressure on reducing the focus on tobacco, including the smoke free world initiative. This was marketed as an attractive package for producers owing to the perceived decrease in cost-per-unit-effort associated with the cultivation of soy: less labour demand to return ratio than tobacco.

The fluctuations in production seen more recently can be attributed to production issues and successive regional droughts in 2015-16.[273] Ongoing issues relating to insufficient supplies and dissemination of improved seed varieties, as well as unsustainable seed viability through seasons (i.e. recycling), coupled with a lack of best management practices, poor crop husbandry and a general lack of awareness about opportunities regarding processing and the utilisation of technologies and mechanisation, continue to undermine the expansion in the area used for cultivation. Amplifying these issues at the production node, producers also suffer downward pressures from market actors; local market prices can be highly volatile for farmers who sell the bulk of produce at farm-gate (i.e. downward pressure on producers from middlemen and traders).[274]

Figure 45: Soybean production in Malawi

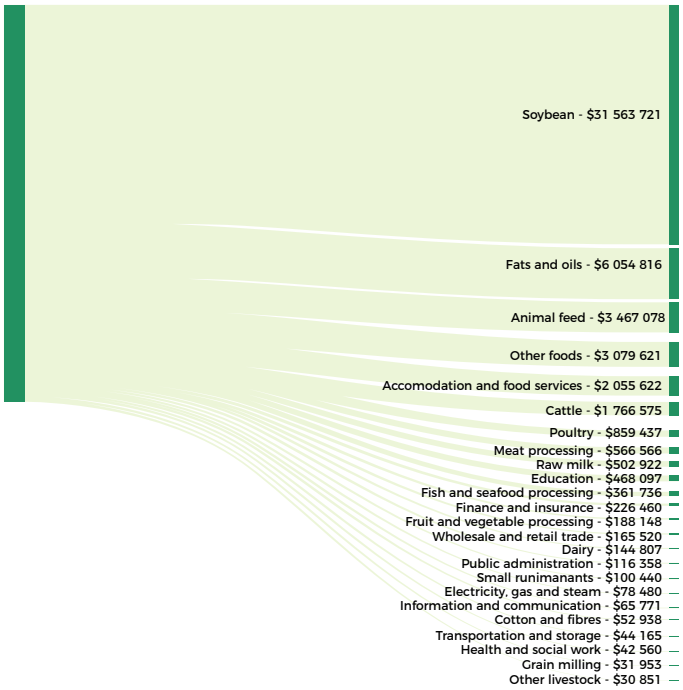


Source: Adapted from FAO, Tilatso (2018), and Government of Malawi (2013)[275, 276, 277]

Extrapolating this further, average productivity (T/Ha/annum) remains low: approximately 0.8-0.9T/Ha/annum on plots that are typically 0.2-0.5Ha in size. When compared with the global average yield of approximately 4T/Ha/annum, this appears very low indeed, though when considering the aforementioned limiting environmental factors that affect most producers, this is in line with low-input yield estimates (i.e. rainfed conditions in tropics and subtropic conditions, with intermediate to low input rates – 0.8-2.8 T/Ha/annum).[278, 279] However, recent studies have stated that under suitable conditions, in specific regions, producers can increase production rates significantly. In such studies, producers that adopted improved soybean varieties and agronomic practices (ISVAPs) saw a 61% increase in yields and 53% in incomes on average. This coincides with reports from other nations where production rates can reach >4 T/Ha/annum. This is in line with the potential yields for irrigated production, in tropics and subtropics proposed by experts, with high and intermediate levels of inputs – 2.0->5 T/Ha/annum).[280, 281, 282]

In 2011, Markets and Economic Research Centre of the NAMC suggested that the demand for soybeans in Malawi was expected to grow to 131,000 by 2020 (approximately 7.7% p.a. growth).[283] As evidenced by the above figure, this estimate seems to be on track. More recently under the Soybean Innovation Lab project (linked to USAID Feed the Future) research regarding the economic effects (and multipliers) of expanding soybean production 25% would have significant and wide-reaching benefits for the wider economy: downstream impacts in oil and animal feed sectors linked to the soybean value chain (see Figure 46. It is argued that this increase in production would require better utilisation and adoption of superior seed varieties by smallholders (i.e. low-cost agronomic input bundles) and that >60% of the beneficial impacts would occur within downstream segments of the value chain and approximately 30-40% for upstream actors and services. These multiplier impacts would occur as soy has many linkages with a wide range of sectors (upstream and downstream) and would also serve to contribute towards more stable markets and high farmer prices: greater sustainability.[284]

Figure 46: Adjusted total economic impacts from USD 15million (25%) increase in soy production



Previous projects such as Malawi Oilseed Transformation (MOST) estimated that there are approximately 250,000 smallholder soybean producers throughout Malawi, though very few produce soybean as a primary focus crop: often secondary or alongside various others. The initial production, trading and primary processing nodes of the value chain are responsible for providing an additional 5,000-10,000 low-skilled jobs in trading and processing. Recent surveys indicate that incomes vary between producers based on location, scale of production and quality of outputs. On average, smallholders who sell unprocessed soya attain sales prices of approximately 210 MWK/Kg, in contrast to those who sell processed soya for approximately 500 MWK/Kg, though these figures vary somewhat. Total revenue is also dependent on product form, with unprocessed revenue of approximately 181,000 MWK/Ha in comparison with 300,000 MWK/Ha for processed soya.[285] The crop contributes 30-50% of total income of producers.[286]

Land usage profile: tenure and size of production units

As aforementioned, the majority of soy producers are smallholder farmers, operating low-input and low-output systems. Land sizes are typically small (<1 Ha/household), though can be significantly larger (<12 Ha/household).[287] Recent surveys for programmes such as GIZ GIAE have shown that land used for production of soybean typically amounts to approximately 30% of total cultivable land size.

Land in Malawi is designated under three categories: government or public, customary and private. The majority of smallholder production takes place on customary land where cultivation rights and usage are orchestrated by traditional authorities of the area. Due to the country's rapidly increasing population, the availability of customary land has decreased significantly over recent generations, leading to widespread disputes over land ownership and use.[288] Due to the pressures that this places on land availability for production, it is argued that the best way to improve efficiency and profitability is to focus on the development of improved varieties and practices on existing production areas, with strains that exhibit traits that are suited to the market: whether domestic or intended for export.[289]

Recent adjustments to legislation seek to formalise this system. More specifically, the Customary Land Act (2016 – effective 1st March 2018) seeks to transition away from large, traditional authority-owned/led land systems, instead empowering individual landowners. This change provides an opportunity for smallholder farmers, as in future as it may ease the process

of securing financial support from commercial and informal finance institutions, whether these be banks, MFI's, VSLAs or others (i.e. loans and credit).[290]

Malawi faces growing difficulties in terms of access to land, as it is a small country and most land is under customary ownership and cannot be bought for commercial use. This puts the country at a disadvantage in terms of increasing revenues by increasing the amount of land under cultivation. However, the Malawian government has shown its commitment to tackling this issue with the recent passage of the Land Bill, which allows for the purchase and registration of customary land. This in turn could lead to increases in soybean productivity. This puts the country at a competitive disadvantage to neighbours such as Zambia, where land is a lesser constraint. However, merely increasing the land under cultivation is neither sustainable nor feasible for many smallholders. Increasing productivity per acre becomes important, which can be aggregated by cooperatives, buyers, etc.

Demographic composition of the value chain

In Malawi the majority of actors involved in soy production are smallholder farmers (>250,000 households – though some reports indicate that this number could be increased by tenfold). These producers account for >90% of total production.[291] Smallholders are typically organised using traditional cooperative and association models. It is through these mechanisms that they receive extension support and training from the government, as well as donor-funded programmes. This in part has been driven by the need to organise producers around irrigation schemes. Due to a lack of financial management systems and governance, these groups often require ongoing (i.e. semi-permanent) support from donors to enable continuation. These cooperatives and producer groups then typically sit beneath other umbrella institutions: associations such as the Farmers Union of Malawi (FUM), the National Smallholder Farmers' Association of Malawi (NASFAM) and the Malawi Union of Savings and Credit Cooperatives.[292]

These smallholders largely produce GMO-free strains of soy unlike their competitors in surrounding nations, and much of the global industry. Non-GMO soy commands a premium in some export markets. This in part can be attributed to ongoing research and development via government-led strategies (e.g. Farmer Input Subsidy Programme – FISP), donors and NGOs (see: Institutional framework).[293, 294, 295] However, unfortunately the majority of smallholders are largely excluded from seeing the benefit of national or global export trade directly. This is in part due to the role of traders and vendors, who typically control the pricing and selling of soy in rural areas, but perhaps more importantly, the large, aggregated quantities that are required for this trade, and aggregation favours the bulking agents.[296]

The soybean value chain offers opportunities for both men and women. According to recent gender analyses, in some instances, soybean is sometimes viewed as a 'woman's crop' or 'garden crop' and thus most of the production and primary processing activities are controlled by female farmers: threshing, winnowing, sorting and cleaning are typically female responsibilities.[297, 298, 299] In contrast, men have a greater role in marketing, sales and money-handling.

More specifically, deep-dive analyses for the soybean value chain in Malawi have revealed that despite exhibiting greater effort than men in most tasks, women are often disempowered and their decision making suppressed.[300] Lower decision making then reduces women's ability to choose how income from soy production is used at the household-level. A detailed breakdown of gender roles is provided in Table 72 below. This data was collected as part of USAID (FtF). below. This data was collected as part of USAID (FtF).

Around 60% of households are matrilineal. These households follow descent through the female lineage and land is transferred from mother to daughter upon marriage. The remaining households (approximately 40%) are patrilineal. These competing systems lead to discrepancies in land inheritance and entitlement, decision making at the household level, socioeconomic

standing, and nutritional outcomes. Research demonstrates a positive association between a woman's decision-making power and children's education, particularly for daughters in matrilineal households.[301]

To maximise female participation in upgrading value-addition in Malawi, and in turn maximising the benefits of value chain improvement in general, several courses of action are needed. These include improving female access to inputs; intentionally making technology choices available and accessible to women; and creating avenues for women to trade across borders, among others.[302]

Table 72: Men and women soybean activities, Ulongwe EPA, Balaka District

	Men's responses		Women's responses	
Soybean Farming Activity	Men	Women	Men	Women
Seed sourcing from NASFAM	--	--	XXX*	
Land clearing	XX	XX	XX	
Land preparation	XX*	XX	*	XXX
Planting	XX*	XX*		XXX
Weeding	XX*	XX*	--	--
Banking	XX*	XX*		XXX
Constructing raised platform for temporary storage	XXX*		--	--
Weeding	--	--		XXX
Harvesting	XX*	XX		XXX
Harvesting and carrying the soybeans home	XX*	XX*	--	--
Carrying soybeans from raised platform to drying area	XX	X	--	--
Drying				XXX
Threshing	XXX			XXX
Winnowing		XXX		XXX
Packing soybean in bags	XX	XX	--	--
Grading	XX*	XX*		XXX
Making decision on what to keep or what to sell	XXX			--
Transport	XX*	XX*	XX	XX
Marketing (vendors for women's responses)	XX	XX	XX	XX
Negotiating prices			X	XX
Who receives the money (budget)	XXX		X	XX
Discussing/making decision on use of soy income	XX	XX	--	--

1/ * hired labour

2/ "X" – some labour; "XX" – most labour; "XXX" – all labour

3/ "--" activity was not identified by respondent

Source: Group interviews with NASFAM men and women farmers and members of Ulongwe EPA

Source: USAID (2014)[303]

Other research highlights the causal linkages between the role of women with household tasks (i.e. perceived responsibilities regarding childcare and burdens surrounding food garden production) and their involvement with sales and marketing.[304] Projects such as MOST identified that interventions might benefit women more if contract farming models facilitated a great role for women in sales and marketing activities. included spousal contracts. The project proposed that training should be provided to both genders (i.e. Good Agricultural Processes training and IBCF trainings) and that formalising sales in a warehouse setting may improve access for

women, increasing security and enabling women to gain greater control in this situation rather than other selling points: vendors.[305]

Research has found that land owned and managed by female-headed households yield 25% lower productivity than comparable land owned by men. The social systems that drive this difference can be rooted in various causes: lack of mobility; lower literacy and numeracy; poor access to agricultural inputs (and improved technologies) and markets; tenure insecurity and related investments in land, despite matrilineal land ownership structures; market and credit access; reduced human and physical capital; and informal institutional constraints affecting farm/plot management and the marketing of agricultural produce.[306, 307] Due to these various constraints, it is less likely for women to adopt or gain leadership positions in farmer associations – leading to downstream impacts on an organisational level.[308]

As described later in this report, the ACE has been identified as a possible opportunity for alleviating market access issues for women. USAID-FtF experts have advised that aggregation centres/warehouses (i.e. storage facilities) must be located close to women's location to enable access. Also, strategies must be developed to enable women exhibiting lower literacy and numeracy skills so that they may understand and use mechanisms such as ACE effectively.[309]

It is possible that the gender-specific roles seen with soya production may be partially attributed to the crop's designation as a cash crop at the household level, or the fact that men contribute to farming labour. Additionally, at the household level, some women process soybean to make milk and other soy-blends.[310]

Domestic consumption

Local consumption accounts for >60% of total production (>100,000 T). Owing largely to donor and government-led interventions, the crop has been promoted as an important food crop with high protein content, oils and other essential minerals. A small portion of the total production is retained by producers and is either eaten raw or undergoes minimal, small-scale processing by households or at village-level. Significant portions are processed by larger, peri-urban actors, either for animal feeds, value-added products or for products for domestic human consumption.[311] Additionally, substantial portions (approximately 20-30,000 T/annum) are procured by NGOs for supplemental food programmes (e.g. in school lunch programmes, hospitals, orphanages and refugee relief programmes). [312] Maize flour is sometimes enriched with approximately 20% soybean flour to enhance the protein content, among other nutritional factors. [313, 314]

In research regarding the importance of different crops for food security in Malawi, soy has been shown to provide a key source of vital macro and micro-nutrients, as shown in the table below When compared with other staples (e.g. maize, cassava and sweet potato), the crop does not contribute as highly towards daily calorie intake due to the quantity consumed, though its contributions to other important nutritional factors including protein, iron, zin and vitamin A are high. More specifically, protein is widely considered an important indicator of food security and the quality of dietary nutrition and is an indicator of hunger. Malawian diets typically lack sufficient animal protein due to a lack of access (i.e. availability and affordability), therefore, plant-based alternatives such as soy are of enhanced importance. Iron, zinc and vitamin deficiencies are also common in Malawi, indicating hidden hunger and a lack of access to quality food.

Crop name	Dietary energy supply (Kcal/ capita/day)	Protein supply (g of protein/ capita/day)	Iron content (mg of iron/100g of product)	Zinc content (mg of zinc/100g of product)	Vitamin A content (IU Vitamin A/100g of product)
Soybean	19.0	2.1	15.7	4.9	22.0
Maize	1,134.0	29.9	0.5	0.5	1.0

Groundnut	69.0	2.92	2.0	0	0
Pigeon peas	2.0	0.1	2.1	0.3	28.0
Cassava	151.0	1.6	0.3	1.4	13.0
Sweet potato	225.0	4.6	2.3	0	0
Beans	46.6	3.0	8.2	2.8	0
Rice	48.8	0.9	0.8	1.1	0

Source: Adapted from CSA (2016)[315]

Percentage marketed and traded internationally

The global market for soy continues to grow, with exports increasing from <USD 40 billion in 2007, to >USD 90 billion in 2017. Furthermore, this increase has coincided with a shift in the type of importing markets, marked by a decrease in the share of high-income and upper-middle income countries, and an increase in the share by lower-middle-income countries.[316]

The USA, Brazil, Argentina and China account for approximately 90% of total production (>280 million T/annum combined), with Argentina accounting for approximately 40% of all exports (Figure 47). From 2015/16 to 2018/2019, the United States was the leading global producer of soybeans with a production volume of 120.52 million metric tons in 2018/2019. As of May 2020, Brazil overtook the United States as the leading soybean producing country with a production volume of some 124 million metric tons in 2019/20. Experts anticipate that production will continue to rise with demand, associated with the crops valuable use in biodiesel production.[317] The USA and China are likely to retain a role as leading importers.

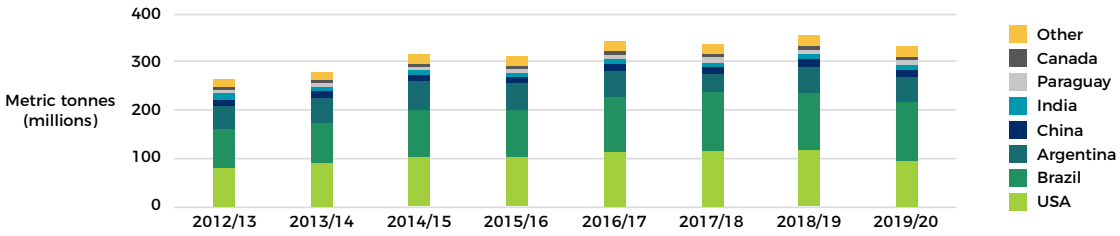
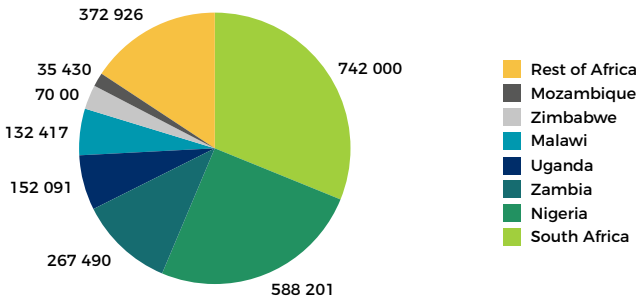


Figure 47: Leading soybean producing countries worldwide from 2012/13 to 2019/20
Source: Statista (2020)

As shown in Figure 48, on the African continent, many countries are seeing an increase in soy production, with South Africa, Nigeria and Zambia producing the highest quantities, followed by others including Malawi. In the majority of cases, the production in these countries is led by large, commercial actors.

Figure 48: Tonnes (T) produced by African countries in 2016



Source: Adapted from FAOSTAT (2018)[318]

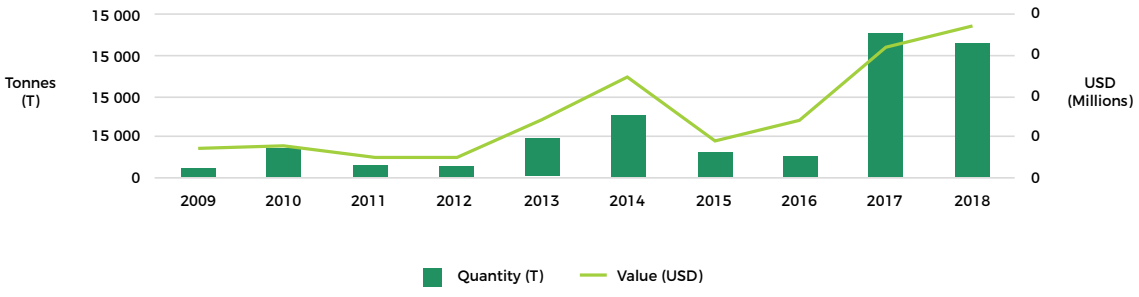
Despite recent production increases in Malawi, the soybean market structures remain under-developed. As is the case with many other crops, rural (and at times urban) infrastructure is lacking regarding storage facilities (i.e. health and safety mechanisms, anti-pest procedures and best practices etc). As a result, most produce is traded in the open market (i.e. direct sales, with multiple actors involved in handling product prior to value addition and upgrading).[319] Market participation and commercialisation are depressed, largely due to poor market access. Unfortunately, in many cases, this lack of access also serves to disincentivise farmers from adopting improved technologies.

Domestic prices are determined by the market but can exhibit high volatility due to erratic interventions by government, such as currency devaluations, administering of export restrictions at harvest and minimum farm gate price regulations. Accurate information on farm gate prices is hard to obtain and prices vary from year-to-year. Assuming macroeconomic conditions remain stable through harvest, average farmgate prices range between 80MWK/kg and 550MWK/kg (mean price was 224 MWK/kg or 220,000 MWK/T) for 2020, with prices average 400 MWK/Kg in October 2020[320] despite the minimum farm gate price advised by the Ministry of Agriculture and Food Security being 300 MWK/Kg. Research and recent statistics demonstrate that government lacks mechanisms for enforcing these prices.[321]

Government prices stem from estimated production costs determined by MoA officials, though figures are not based on a survey. This practice not only hinders producers in their decision makers, but also causes a negative influence on downstream actors. Accounts from feed millers and traders indicate their hesitation for buying directly from farmers at market prices. Instead, they purchase from commercial traders who bring soybeans to their premises. Minimum price fixing creates uncertainty among market operators who bought produce at market prices and distort normal buying and selling activity, even though it is only a recommended price based on an estimate of average of cost of production.[322] Analyses of soybean market have found that there are no trader-based organisations or marketing groups in the markets which affect bargaining power. As such, price setting is mainly determined by traders on an individual basis. Research by IFPRI (2020) showed that >90% of soybean farmers sold their crops for prices below the official minimum prices; prices received by farmers were approximately three-quarters of the relevant minimum farm gate prices (74.7%).[323] Despite this, these prices mark an increase on previous years, where prices were on average closer to 150 MWK/Kg.

As shown in Figure 49, Malawi exported >50,000 T of soy in 2018 and there has been a significant increase in exports over the last decade, and >80% since 2015. In terms of value, these exports have generated >USD 22 million, therefore accounting for over 60% of the crops total value. The average price of exported soy was approximately 1.6 USD/Kg in 2018.[324]

Figure 49: Tracking quantity (T) and value (USD) of soy exports for Malawi



Soybeans exports can be categorised into four broad groups: raw/semi-processed; by-product; medium value-added; and higher value-added. These are expanded upon further in Table 73 below, where one can see that Medium and Higher value-added products contribute the most to export values. The highest contributors in terms of export value are crude soybean oil and various other prepared foods, which combined account for >70% of total value.

Neighbouring markets within SADC are of key importance, with South Africa a major importer of almost every form. Malawi ranks highly for specific segments. For example, during the 2013-17 period, it was ranked in the top-5 exports for soybean seed (number one exporter in SSA) and soybean oilcake (number three in SSA, behind South Africa and Zambia). This said, there is space for improving on these trends and executing better exploitation of export opportunities. For example, the country's oilcake exports to South Africa account for a mere <0.07% of South Africa's total import of the product (USD 155,370 of USD 231,260,780).

For many soybean products, non-African markets play an equally important role, especially for higher value-added products. For example, crude oil products to Argentina accounts for >30% of total export value. Though overall, when compared with other producer-exporter countries, these exports are small, they represent a significant opportunity and demonstrate the ability of Malawian companies to comply with the different regulations and requirements of these markets. In the short-mid-term future, it will be important for Malawian actors to focus on increasing volumes, whilst also continuing to improve quality with an aim to better utilise these high-value markets. The EU market is untapped and may provide a viable option due to the crop's non-GMO status. Italy has the largest untapped potential of >USD700,000, and countries including Spain, Germany and the UK have combined export potential valued at >USD970,000. However, there are currently no actual exports to the EU.[325]

Table 73: Malawi's top export destinations for value-added soybean between 2015-2017

Value-added segment	Product Type	% of all value-add exports	Destination Country	Value (USD)	% of export value	
Raw/Semi-Processed	Soybean seeds*	0.4	Mozambique	76,657	69.1	0.2
			Zimbabwe	18,530	16.7	0.1
			South Africa	15,828	14.3	0.1
	Other soybeans*	8.0	United States	2,470,422	100.0	8.0
By-product	Soybean oilcake	0.7	South Africa	155,370	69.8	0.5
			Zambia	57,600	25.9	0.2
			H. Kong/ China	9,720	4.4	0.0
Medium value-added	Crude soybean oil	40.2	Argentina	9,449,990	75.8	30.5
			Malaysia	1,754,820	14.1	5.7
			South Africa	835,030	6.7	2.7
			Mauritius	340,060	2.7	1.1
			Indonesia	89,190	0.7	0.3
	Refined soybean oil	1.6	South Africa	260,100	54.1	0.8
			Zambia	150,770	31.4	0.5
			Singapore	27,310	5.7	0.1
			Mauritius	21,190	4.4	0.1
			Mozambique	21,020	4.4	0.1
Higher value-added	Soymeal and soy flour	17.3	United States	3,057,990	57.1	9.9
			South Africa	1,015,590	18.9	3.3
			Italy	690,860	12.9	2.2
			Belgium	459,630	8.6	1.5
			Indonesia	136,040	2.5	0.4
	Soy sauce	0.1	South Africa and	19,350	88.0	0.1
			China	1,780	8.1	0.0
			the Netherlands	350	1.6	0.0

			India	340	1.5	0.0
			United States	160	0.7	0.0
	Others**	31.9	South Africa	8,985,830	90.8	29.0
			Turkey	361,610	3.7	1.2
			Denmark	333,540	3.4	1.1
			United States	114,830	1.2	0.4
			China	99,960	1.0	0.3
* whether or not broken seed | ** food preparations not specified elsewhere, including tofu						

Source: Adapted from UNCTAD (2019)[326]

Unfortunately, the protocols surrounding international trade (i.e. both import and export) are poorly defined and mismanaged.[327] Various international organisations have highlighted that government-enforced/led non-tariff measures (NTMs) are critical obstacles to increasing exports.[328] There are multiple steps involved in exporting soybeans: multiple documents and government agencies.[329] A list of necessary export documents, costs and times required are given below.

Table 74: Summary of export process

Step	Cost (MWK/USD)	Time (Days)	Procedure/ Office Visits	Docs	Institutions involved
Agricultural Permit	10,000 (14)	10	3	4	MoAFS
Export Permit	0 (0)	28	3	3	MoAFS, MoITT
Currency Declaration Form	9,500 (13)	7	3	3	bank, RBM
Phyto-sanitary Certificate	2,000 (3)	7	2	0	PPS
SADC Certificate of Origin	5,000 (7)	1	1	1	CoC
Weighbridge Certificate	1,000 (1.5)	1	1	2	NFRA
Customs Declaration	20,000 (27)	2	2	4	MRA
Total	47,500 (65.5)	56	15	17	8

Source: USAID (2013)[330]

Despite the country's inclusion within SADC free-trade policy agreements, it has been flagged that the Malawian government hamper export opportunities by setting administrative restrictions on soybean exports and holding a controlling influence on domestic price-fixing[331]. Though this situation may change as a result of the recent change in government in 2020, there remains ambiguity regarding the need for Government licenses for export and strategies to alleviate barriers.

Exporters, and governmental officials offer differing opinions regarding the need for specific licenses for exports. In 2013, MoITT indicated that soybeans and other legumes do not require Export Licenses (Customs Commissioner issued Circular No. 6). However, shortly after confusion arose with MRA and customs clearing officers at border posts as they still demanded export licenses. This specific case highlights the lack of consistency in guidelines and between different government agencies and actors[332].

Similarly, though the government instigated changes to the exporting process in 2015: reducing the number of days and official papers required for export (from 44 to 34, and 16-9 respectively), the majority of exporters (>60%) report that administrative delays contribute to challenges when exporting[333]. Moreover, it is important to note that these figures, from official sources, do not account for the myriad of options for informal cross-border trade with neighbouring countries (e.g. Zimbabwe, Zambia, Tanzania etc.). These avenues and trade corridors are of significant importance to livelihoods of those engaged – notably informal actors and women. A

better understanding of these systems is important to ensure opportunities can be realised in terms of inclusion, quality assurance and traceability (i.e. relating to compliance with minimum health or safety standards).

5.1.2. Value Chain Actors and Status

Value addition

Following harvest, a significant majority of beans are processed for their oil and meal (accounting for 18% and 38% respectively). These then undergo further value addition: the oil, largely for human food production (i.e. cooking oils, fried goods - margarine etc), and the meal/ soybean cake for use in animal feed (i.e. for domestic livestock, poultry and fish feed industries as well as export) due to its high protein content[334]. A small percentage is retained by producers themselves, or passed to processors destined for human consumption: flour for porridge, soy milk, formulated protein and tofu: as meat-alternative protein source and other retail food products. Some remaining soybeans are also used in many non-food, industrial products[335].

Upstream activities

In addition to local firms (NGOs and Ministry of Agriculture), local agro-dealers are the primary seed suppliers for soy. Agro-dealers sell various soybean seeds, mainly acquired through large scale seed companies such as Seed-Co Malawi Ltd. among others. Additionally, the Association of Smallholder Seed Multipliers Action Group (ASSMAG) also provides seed to farmers. However, importantly, the majority of farmers still use their own recycled seed or seeds obtained through FISP: provides 95% of certified seed. Companies such as Agriculture Input Supply Ltd produces and distributes soybean inoculant on the market. Although still in nascent stage, smallholders have indicated cultivating up to 2T/Ha of soybean where inoculant was used[336]. Use is still limited, and >90% of farmers do not use inoculant.

Almost all producers lack irrigation support for their farming (approximately 99%). Furthermore, mechanisation is also very limited (<2% of farms), this in part can be attributed to the limited number of tractors available for hire[337]. Research studies have demonstrated how various factors contribute to production rates. More specifically, five key factors affect the productivity of farmers: the amount of labour contributed to the crop, contact time with extension workers, the volume of soy produced in the previous year, farm gate price and the education level of lead farmers have a positive influence on production that is achieved[338]. As aforementioned, the significant majority of producers are smallholder farmers and there are very few commercial producers, mainly Alpha Milling Company (Central Poultry Feeds, CP), who are vertically integrated and are therefore involved in trading, processing, and usage of soybean.

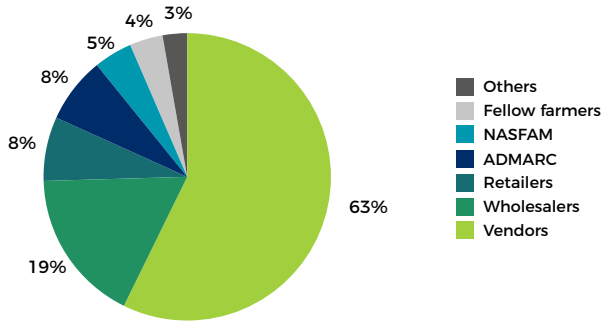
Downstream activities

Post-production, the majority of smallholders (>85%) sell their produce directly to small-scale traders and other representatives of downstream actors in rural trading centres (see Figure 50), with the remainder either retained in small quantities for themselves or sold directly to consumers at local and government markets. More specifically, the bulk of sales consist of traders and vendors, retailers, wholesalers, companies and individual households or fellow farmers. More specifically, as shown in Figure 16, most (64%) producers sell to vendors and traders, followed by wholesalers, retailers or associations, with the remainder going to fellow farmers and others (19%, 9%, 8%, 5%, 4% and 4% respectively) – though these figures are likely to vary slightly year-to-year. Other buyers include Mulli Brothers Group, Farmers World Company, Export Trading Company, Takondwa Company and Agrodealers, Transglobe, Agora, Senwes, Kulima Gold, Kachande Brothers (Produce Traders), Dalitso General Suppliers, Takondwa Trading (Milward Nyangulu), Chitsotsa Trading, ACE, Exagris and Clinton Hunter.

From here, vendors act as middlemen, selling produce in bulk to livestock and poultry feed mills (e.g. Grain & Milling, Charles Stewart, Central and Crown Poultry, Agrifeeds, Glane

Poultry, Ndatani Premier Feeds, KK Millers, Maldeco and Proto etc.) general processors (e.g. RAB Processors, Global Trading, Farmer's World, Export Trading Group, Lever Brothers, and ADMARC) and oil processors (National Oil, Capital Oil, Home Oils, Capital Oil Refinery Limited, FASASun Gold Limited and Sun Seed Oils)[339, 340]. This said, processors do sometimes procure soy from structures such as NASFAM: as a representative of producers[341]. Large processors such as RAB, Global Trading, Farmers' World and Export Trading play a key role in processing soy into a range of value-added products designed for local markets: soymilk, soy flour, and soya pieces. RAB processors are a key producer of infant and baby formula[342].

Figure 50: Destination of sales (%) for smallholder soy producers



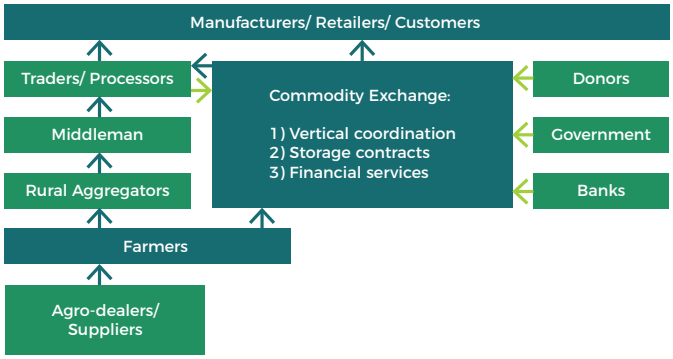
Source: Adapted from Nzima & Dzanja (2015)

In addition to being a source of domestic protein, the production of meat, particularly poultry, has been driven demand for soymeal-based feed: exported to neighbouring countries such as the United Republic of Tanzania and Mozambique.

A different pathway, though still underdeveloped, lies through commodity exchange. Commodity exchanges offer the advantage of storage capacity for producers, lower input and risk on marketing activities, and reduced supply uncertainty for traders because of sustainable aggregation. Malawi currently has two established commodity exchanges: The Agricultural Commodity Exchange (ACE) and Auction Holdings Commodities Exchange (AHCX): ACE relying on donor subsidies and AHCX supported by government. Sustainability of these actors will rely on expansion and trust development.

Some experts note that there is no great need to have two separate commodity exchanges in the country due to the scale of production: challenges relating to aggregation volumes. The role of other actors, such as NASFAM and other aggregators is vital for future sustainability and functionality. In order for smallholders to see profit and to maximise benefit from interest rates from this setup, NASFAM are key aggregators. These challenges have also made it more difficult to achieve buy-in from processors to start listing, since the volumes traded remain lower than needed[343]. The role of the role of ACE in value-chain is shown below[344]:

Figure 51: The role of ACE in the soy value chain



Source: Dentoni and Dries (2015)

Under the MOST project, reliable smallholder producers who could demonstrate a track records of selling commodities to ACE were provided with input packages in order to encourage and increase soybean production. This 'Incentive-Based Contract Farming' (IBCF) model sought to develop farmer–market linkages, with ACE and the producer becoming co-contract holders through the incentives. This mutually beneficial model incentivised producers: using pre-financing packages included seed and inoculant, since these are perhaps the two major challenges faced by producers, to ensure a retention in relationship.

This model did bring success from a market-linkage perspective (i.e. 94% of farmers repaid in the first year), leading to these producers receiving larger packages in the subsequent year, enabling them to expand production and increase efficiency. However, outside of subsidised programmes, it remains difficult for the ACE model to become fully viable in Malawi: commercial viability. ACE is still not fully self-sufficient and struggles to cover its operational costs, bridging its financial gap with donor support. This chicken and egg situation is primarily owing to lower-than expected production efficiencies[345, 346].

Case Study: The Agricultural Commodity Exchange (ACE)

ACE aims to mitigate fluctuations in supply and demand, by providing storage space at a daily fee, in farmer-trader transactions (WRS) and mechanisms to buy and sell products (BVO or OVO). ACE connects rural Farmer Associations with rural warehouses to encourage local, bottom-up initiatives to providing storage and trading linked with private sector in urban centres. This storage in secure warehouses enables the producer to choose when to sell, to attain the best price. The WRS was designed to improve incomes and post-harvest loss reduction: promoting financial inclusion by supporting quality markets through collective storage and marketing. ACE currently has >30 warehouses (including partners) representing ±225,000 T storage space available for third party deposits. ACE offers financial support and collateral finance and disseminates market information, demonstrating a hybrid model combining private sector and "trust" business models. The core services provided to smallholder farmers include warehouse receipt system (WRS); trade facilitation and inclusivity; and access / dissemination of market information.

Buying Model (Warehouse Receipt System): Upon deposit, crops are bought for the market price on the day of deposit. The depositor pays a nominal fee for daily storage and initial cleaning, grading, re-bagging and stacking (i.e. storage). The depositor is issued a receipt, stating the volume and grade quality to enable access to higher-value markets. This enables ACE to provide more affordable credit provision to farmers, using the stored commodity as collateral (<70% value of crop deposited). The system may be used multiple times (i.e. multiple warehouse receipts can be aggregated and sold together) enabling economies of scale and price premiums to the depositor. Two distinct auction methods are provided: Reverse auctions in which customers may bid volume only and Traditional auctions in which customers may offer volume only (Traditional auctions typically attract domestic and regional buyers). An important feature of the model is the relationship between ACE "Trust" and ACE "Ltd": the ACE structure guarantees balance between farmer associations (ACE Trust) and private sector traders, banks and suppliers (ACE Ltd).

Trade Facilitation and Inclusivity: A crucial factor in determining the success is the formation and adoption of ACE by associations, cooperatives and aggregation schemes. Post-adoption, a core focus for ACE is education. This involves working with rural communities (topics include cash flow, transportation logistics and grouping methods). Until recently this has been subsidised by donor funding (MOST, Food Aid and WFP among others), although ACE has achieved 60% towards the internal target of financial sustainability and self-sufficiency.

Access to Information: ACE provides general information on trading sessions, as well as adverting prices and sales opportunities in various media outlets: news, newspaper, radio to ensure improved access to information for rural stakeholders. Additionally, the Exchanges

also provide a system of procurement alerts through SMSs and web-based information to different stakeholders including farmer groups. General market information is offered as a free service to the farmers.

ACE offers promising opportunities for engagement, including involvement in the creation and establishment of its Structured Trade Taskforce, outlined in the Recommendations section.

Value chain mapping

The soybean value chain in Malawi has seven key groups of actors, though some are underdeveloped or underserved.

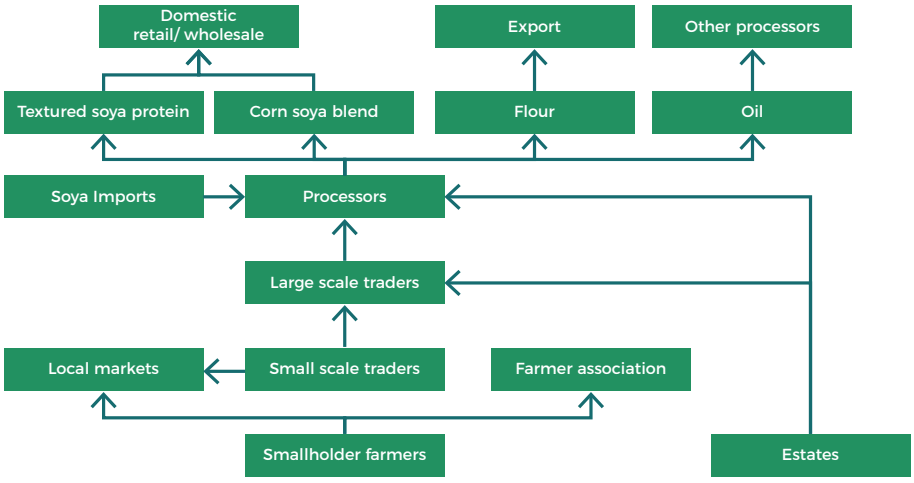
Input suppliers provide producers with a range of different inputs throughout different stages of the production cycle: agricultural inputs such as seed, inoculant, lime, fertiliser and herbicide; to equipment, including irrigation systems and access to tools and mechanisation services. As aforementioned, unlike in neighbouring countries, smallholders are the dominant Producers in Malawi. Operating on small, household plots and in rotation with other food and cash crops.

Post-production and harvest, Traders represent the link between producers and downstream actors. As such, they are responsible for providing a market for these producers and processors have a reliable supply for their inputs. Traders have a dual role in the chain, as they buy from domestic producers as well as importing subject to the requirements of processors.

Those who are responsible for aggregating domestic volumes, typically in rural areas, are known officially as Aggregators. Unlike in surrounding countries with a greater percentage of commercial producers, most Storage in Malawi occurs on-farm. This system is marked by poor conditions: significant economic losses as a result of spoilage, quality deterioration and poor pest management. Due to the lack of large commercial players, there is a general absence of traditional silos in trading centres.

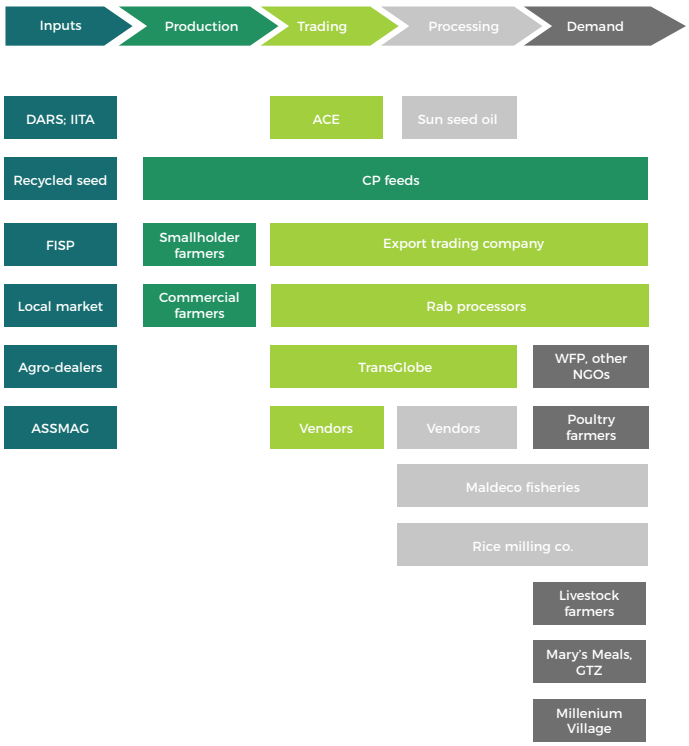
After aggregation and transportation, Processors convert raw beans into meal, oil or products for human consumption. Following this Feed manufacturers use the meal produced by processors towards animal feed production: poultry, beef, pork and fish farming. Remaining, the end Consumers include livestock, poultry and fish farming industries (i.e. animal feed), as well as retail industries and food programmes (i.e. aid and relief agencies) who use processed products for human consumption.[347]

Figure 52: Simplified soybean value chain



Source: Kadale, Imani Development, and TetraTec (2013)[348]

Figure 53: Soybean value chain with actors



5.1.3. Capital and Financial Services

Table 75 below illustrates the different costs associated with soy production. This data is representative of a snapshot study, as part of GIZ GIAE impact assessments.

Table 75: Basic Gross-Margin Analysis for soybean producers

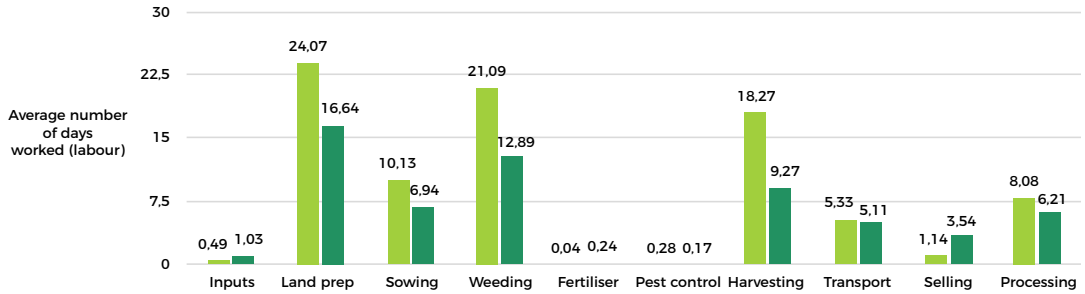
GM Category	Factor	N	Mean	St. Dev	Med	Min	Max
Costs	Production Area (Ha)	220	0.79	1.05	0.4	0.10	12.00
	Land rental (MWK Cost/Ha)	85	42,358	19,066	37,500	6,000	112,500
	Seed Costs (MWK)	90	29,491.71	25,336.27	20,000.00	1,750.00	112,500.00
	Inoculum, lime, plastic	153	4,982	5,983	3,000	900	33,800
	Post-harvest inputs	154	14,592	23,493	5,550	150	138,000
	Labour (Hired)	127	87,756	72,106	66,998	5,000	420,000
Sales	Unprocessed	205	180,727	269,747	62,500	3,125	2,450,000
	Processed	133	302,794	206,905	250,000	13,000	1,275,000
GM	Gross product revenue/Ha	215	359,631	266,518	316,875	24,000	2,450,000
	GM Profit/Ha (no seed)	207	263,012	169,407	232,500	44,906	796,470
	GM Profit/Ha (seed)	207	250,993	165,612	224,550	59,906	697,277

According to recent surveys, the majority do not buy or rent land. For those that do, the cost of rented land varies depending on size and geographical location: averaging approximately 37,500 MWK/Ha. In order to achieve optimal productivity, farmers who have access, utilise a range of inputs throughout cycles. One of the most important proponents of high productivity is suitable and high-quality seed, though approximately 50% of farmers do not purchase any seed, indicating that they instead recycle seed from previous cycles. The average seed cost is 20,000.00 MWK/Ha.

Owing to soybean being mostly considered as a cash crop, it is not unusual for farmers to spend more on inputs for soybean than other partner crops. However, the amount that is spent may vary significantly. Many farmers spend more on post-harvest inputs than in-production inputs (e.g. fertiliser, fungicide, insecticides and herbicide are used by very few farmers). Total cost of inputs is typically 25-30,000 MWK/Ha.

Approximately 60% of producers indicate that they hire labour for various tasks throughout production cycles. These hired hands vary by gender and age group: mostly adults (of both genders). This may be attributed to the types of jobs that are required (i.e. in terms of physicality, pay or timeframe). The cost of labour accumulates and represents one of the most expensive features of overall cost at approximately 70,000 MWK/Ha. Instead of paying for additional, casual labour, it is commonplace to enlist the support of family members. As such, >80% of soybean producers did as well. The breakdown of labour tasks is provided in Figure 54 below.

Figure 54: Average # of days worked by hired and family labour



Source: GIZ (2020)

Most farmers sell unprocessed soybean, rather than undergoing processing or retaining for consumption or seed i.e. approximately 50% sold, <5% retain for home consumption and seed), despite prices for even basic processed products being higher than the price of unprocessed products. Gross margin figures (i.e. GM = Gross product – variable costs – land costs / area) including seed and excluding seed show that the crop is highly profitable, but also raises questions about the validity of using seed – marginal gains. Money gained from sales is used for different things depending on household needs. As such, for households that receive large sums are more likely to spend the money on upgrading the household: iron sheets for houses, and investment in human capital: school fees. In contrast, those who sell smaller amounts or gain smaller sales value with vendors are more likely to spend on household goods: food products, salt and soap, or sometimes clothes.[349]

Financial services accessed

Financial services and credit lines are important as they enable farmers, including smallholder famers, to procure vital inputs: seeds, fertilisers and even labour and for small businesses and other enterprises to expand processing and trading activities. Despite this, only a small percentage of smallholder farmers report accessing financial services (10-20%).[350] This can be attributed to multiple factors: poor or limited access to financial service providers within locale, undesirable interest rates or repayment terms. This limited access stems from a lack of risk mitigation or insurance, and this reduces their capacity to invest in their productive assets and effectively keeps them trapped within the perpetual cycle of subsistence farming and at risk of poverty and food insecurity. In recent surveys including producers from the soy value chain, respondents indicated that when they did take out a loan the average amount was low (<20,000 MW).[351]

In a wider sense, of the 12% of rural Malawians that took out loans in recent years, approximately 60% of those were from informal providers. This informal sector includes individual money lenders, Village Savings and Loans Associations (VSLAs) and Rotating and Savings and Credit Associations (ROSCAs), some of which are highly exploitative and incur significant risk for loan takers: requiring collateral (e.g. titled land), high-interest rates and specific conditions. Similarly, many MSME owners, vendors and traders do not have clear access to commercial financial providers. This said, financial inclusion has improved from 45-54% according to the 2017 FMT Survey.

To remedy this, innovative financing mechanisms are critical to enable smallholders and small business owners to invest in diversifying away from primary agriculture into basic processing and other options, as well as improving their farming practices (e.g. modernising, mechanisation and innovation). This is one of the key roles of Micro-Finance Institutions (MFIs). In partnership with donor programmatic support these MFIs initiate innovative credit packages that are responsive to smallholder's needs. However, Unfortunately, the majority of MFIs are underserved, with limited reach and therefore impact: reaching <20% of the Malawian population.[352]

Another exciting prospect over recent years is the growth of mobile money. The emergence of multiple service providers offering relatively low operating costs has driven financial inclusion. Providers such as Airtel and TNM now provide phone-based agricultural information as well as offering collateral-free loan products and debit facilities that accessible from even remote locations. Innovative products and service such as these offer the potential to accelerate financial inclusion in rural areas including smallholders. The recommendation to facilitate the provision of extension and market data services via mobile and ICT technologies is informed by these recent developments (see "Recommendations" section).

5.1.4. Environmental Factors

Impact on environment and natural resource base

Soy cultivation can bring multiple secondary environmental benefits, relevant to the aforementioned climate-induced issues. When integrated/intercropped with other cereal grains, soy can reverse land and soil degradation and increase yields of these crops: grown in rotation with soy. This is in part due to the nitrate-sparing effect of soy (i.e. residual Nitrogen is made available from roots or plant material: nitrogen fixing), which also helps to reduce producer's dependence on inorganic fertilisers for other staples.[353, 354] For this to occur, Phosphorus is critical.[355] The absence of sufficient Phosphorus in soils can be a key yield-limiting factor for optimal soy production. Weathered/malnourished soils may have limited Phosphorus, and this combined with poor access to inoculants can negate the secondary positives of soy production.[356] Therefore, providing Phosphorus can have both positive environmental and economic implications. Soy is also known to reduce the Striga seed bank from the soil, which helps to increase yields of other cereals: particularly in semi-arid zones.[357, 358] Additionally, though the crop is susceptible to soybean mosaic and the yellow brown mosaic viruses, these have not been identified as critical risks in Malawi.

Resilience to climate change and natural resource degradation

Research conducted by the International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) has analysed the potential effects of climate change on agriculture in Malawi (2020-2050): including scenarios with and without climate change (CC and NoCC). Their results indicate that areas under soybean cultivation are likely to decrease under both the CC and NoCC scenarios due to increased land pressure and water shortage, though the decrease is projected to be slightly smaller (<1pp) under CC compared to the NoCC scenario. They argue that this indicates that other factors in addition to climate change are important for the sector. The results show that future conditions may be more unfavourable for future production of soybean. However, due to improved practices: largely related to improved seed strains (i.e.

climate and drought resilient etc), may lead to increased production soybean by 1.33% despite climate change.[359] Perhaps more importantly, it is key to consider that since the majority of producers are smallholders, these individuals are most at risk of facing hardship due to changing climates and increasing climate pressures.

Use of Clean Energy

Given that soya and groundnut are two oilseed crops grown by many of the same producers, the lack of clean energy interventions in the soya value chain mirrors that of the groundnut value chain; refer to Groundnut Section.

5.1.5. Institutional Framework

Government-led agricultural policies are rooted in various strategy documents that have spanned the last two decades. The first of modern-times strategies was Vision 2020 (1998), followed by three subsequent national development strategies: The Malawi Poverty Reduction Strategy (MPRS), MGDS I and MGDS II and most recently, MGDS III. Aside from these umbrella strategies, specific sector-level strategies have been developed to guide develop in each specific case. The following section outlines relevant public sector agencies (government Ministries and Departments), their public policies and strategies, as well as key partners (including public, private and third sector) to the soy sector.

Key public sector role-players

Table 76: Key public sector actors

Partner	Role
Ministry of Agriculture and Food Security (MoAFS) | Formerly Ministry of Agriculture, Irrigation and Water Development, (MOAIWD)	Agricultural policies/strategies. http://www.agriculture.gov.mw/
Department of Agricultural Research Services HQ (Min. Agric. & Food Sec.)	Research on varietal development. www.malawi.gov.mw/
Dep. Crop Development (Min. Agric. & Food Sec.)	www.malawi.gov.mw/
Department of Agricultural Extension Services (DAES)	Extension of technologies www.malawi.gov.mw/
Department of Crop Development	Provide guidance in crop production www.malawi.gov.mw/
Ministry of Industry and Trade (MoITT)	www.malawi.gov.mw/ | www.mitc.mw/trade/
Association of Smallholder Seed Multiplication Action Group (ASSMAG)	Farmer owned and controlled rural seed production and marketing organisation.
Soybean Association of Malawi (SOYAMA)	Address soybean trading and marketing issues as well as lobby financing institutions to support the soybean industry

Public policy, strategy, priorities, legislation, regulations, and support interventions

Recent government policies have encouraged crop diversification and value addition to make soybean a highly promising cash crop in Malawi. The Malawian Government is committed to soybean as a key crop for Malawi, as evidenced by National agendas. For example, the Government of Malawi's National Agricultural Investment Plan (NAIP) (2018-2023) outlines the government strategy for agricultural transformation: supporting growth, higher incomes, and improved nutrition and food security. Within the strategy, key pillars of activities include

capacity building, ensuring inclusion, increasing resilience through irrigation and sustainable land management, and investing in research and value addition.[360] Other key government policies and schemes are summarised below.

1. **Farm Input Subsidy Programme (FISP):** FISP provides subsidised inputs to ensure most farmers can afford quality inputs (traditionally targeted at maize production). FISP has faced criticism as subsidisation creates market distortions. Challenges have included perceived corruption and a lack of efficiency with voucher systems, delays in government payments to input suppliers, political interference and a lack of strategy for integrating private companies into the programme. This said, soy production has benefitted greatly from the addition of legumes to the programme. Through FISP, beneficiaries receive (subsidised) 100 Kg of fertiliser, 5 Kg of hybrid maize seed, and 2-3 Kg of improved seed for legumes (e.g. common bean, cowpea, pigeon pea, groundnut, and soy). In contrast to contract schemes offered by the tobacco value chain, few private or public institutional incentives exist for soyabean production.
2. **National Agricultural Investment Plan (NAIP):** This medium-term agricultural development programme is the second Malawi NAIP, building on the Agriculture Sector Wide Approach (ASWAp). The NAIP is aligned to the Comprehensive Africa Agriculture Development Program (CAADP) and the African Union Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods. It is also aligned to the national development policy blueprint, the Malawi Growth and Development Strategy (MGDS III) and serves as the main implementation vehicle for the 2016 National Agriculture Policy (NAP). Soy, as a key oilseed has been identified as an important growth factor, for incomes, food security and trade/export development during the programme period.
3. **National Agricultural Policy NAP):** The NAP defines the vision for development of the agricultural sector in Malawi over the next five years. More specifically, this policy is a guide towards increasing production, productivity, and real farm incomes. The policy will inform the agricultural content of the next medium-term development strategy. The NAP is aligned to Malawi's Vision 2020 and the Malawi Growth and Development Strategy II, which are the overarching long-term and medium-term development strategies, respectively. Following its linkage to the Malabo Declaration, MGDS III, the NAP and other sector policies, its implementation goes beyond the mandate of the Ministry of Agriculture, Irrigation and Water Development (MoAIWD) and requires the commitments, inputs and strategic partnerships of several other ministries, along with Non-State Actors (NSAs) including the private sector. For soy, the NAP outlines the aims and strategy for increasing current production levels (from <1.1 T/Ha to >2 T/Ha).
4. **Malawi Growth Development Strategy III (MGDS III):** Unlike its predecessors (MGDS, ASWAp, MGDS II and Malawi Poverty Reduction Strategy Paper – MPRSP and the NTP), this strategy is focused on improving productivity in order to increase the country's competitiveness and develop resilience to shocks and hazards (climate change) in line with the SDGs, the AU Agenda 2063. Key Priority areas shall be: i) Agriculture, Water Development and Climate Change Management; ii) Education and Skills Development; iii) Energy, Industry and Tourism Development; iv) Transport and ICT Infrastructure and; v) Health and Population.
5. **ASWAp II: Financed by a Multi-Donor Trust Fund (MDTF):** Norway, EU, Flanders, Irish Aid and USAID, the 2nd ASWAp seeks to improve smallholder productivity and market access of selected commodities for said farmers in specific target districts.
6. **National Export Strategy II (NES II):** NES II sought to build on its predecessor NES I (2013-2018). NES aimed to raise export as a share of imports from 52 to 76% by 2017, but largely failed: with only 33% for export as a share of imports and 4% growth in exports. The strategy focused on four core areas: developing export clusters (including oilseed – soya); a conducive environment for economic development and trade; supportive economic

institutions to build the productive base of the economy; and improving competencies, skills and knowledge. NES II also links to the ongoing National Trade Policy (NTP) (2016-2021) which seeks for Malawi become a competitive export-oriented economy, through trade. It recognised the role of MSMEs and aimed to drive structural transformation of the productive sector by supporting and managing domestic market structures and integration in regional and global markets through value chains with the ambition of increasing exports. Soya was identified as one of the value chains for inclusive growth.

Key development partner role-players and support interventions

The main development partners that are active in Malawi include: USAID, GIZ, UKAid (FCDO), EU, World Bank and IFAD among others. A summary of their current activities is given below.

1. **USAID, Feed the Future (Soybean Innovation Lab):** The Innovation Lab for Soybean Value Chain Research (Soybean Innovation Lab, SIL) is dedicated to soybean research for development. The Lab is seeking to improve soybean farmers access to improved varieties of soybean seed: insufficient quantities of seed, few improved varieties to choose from, and seed that does not reliably germinate.[361] In collaboration with the Syngenta Foundation for Sustainable Agriculture (SFSA), the International Institute of Tropical Agriculture (IITA), and the African Agricultural Technology Foundation (AATF), the consortium is implementing an innovative programme that tests different varieties of soybean (i.e. the Pan-African Soybean Variety Trials).
2. **GIZ, Malawi Green Innovation Centres for the Agriculture and Food Sector (GAIE):** GIAE promotes rural development and agriculture to improve incomes and food security. The Malawi country package aims at strengthening the innovation structures that drive and effectively interlink, applied research, training and practical extension work in the field within soy and groundnut value chains. It is expected that this approach translates into improved incomes of agricultural smallholders and leads to more employment in the agricultural and agri-industry sector and thus increase the food security at the local level.
3. **GIZ Malawi, KULIMA – More Income and Employment in Rural Areas (MIERA):** KULIMA-MIERA was initially focussed on four key value chains: with soybean as one (with Cassava, Groundnut and Sunflower. MIERA offers various packages for technical assistance: from direct capacity development in rural areas, to supporting private sector partners and policy processes. A critical focus is placed on developing market integration in order to increase opportunities for rural poor to engage in value addition, by increasing productivity, processing of raw products or reaching better markets. The project has now expanded to include three further value chains (paprika/chilli, macadamia and rice) have been selected for further support from 2018 onwards. KULIMA MIERA departs from market opportunities, focusing on the down-stream part of the value chain (3 key areas: processing, market linkages and marketing). A core partner on the programme is ACE.
4. **World Bank, Government of Malawi, Agricultural Commercialisation Project (AgCom):** AGCOM aims to empower farmers with good financing for investing in agriculture and access to well-structured markets. The USD 95million project seeks to transform the smallholder agriculture sector from subsistence to commercial orientation. To accomplish this, the project will focus on building capacity of producers and smallholder associations towards forming cooperatives, to establish and enforce a focus on production as a business. Key implementing partners include Ministry of Agriculture, Irrigation and Water Development (MoAIWD) and the Ministry of Industry, Trade and Tourism (MoITT). Other implementing partners for the project include the Malawi Investment and Trade Centre (MITC), the Malawi Bureau of Standards (MBS) and the Ministry of Lands, Housing and Urban Development (MoLHUD). MITC will also facilitate access to land for commercial agriculture and assist farmers in identifying export markets for their products.
5. **IFAD, Transforming Agriculture through Diversification and Entrepreneurship (TRADE):** The TRADE programme combines grant and loan funding from IFAD, as well as additional

funding from OPEC and the Malawian government (This USD 125.4 million). Consolidating and upscaling on the success and good practices of the completed Rural Livelihoods and Economic Enhancement Programme (RLEEP), the TRADE programme seeks to improve the livelihoods of rural people, focusing on developing value chains for seven commodities. Among which is soybean. More specifically, it will focus on the commercialisation of smallholder agriculture through strengthened access to markets and financial services, while also focusing on adaptation to climate change, which is key for poverty reduction: strengthening capacity of farmers, organising them into producer organisations and promote partnerships with SMEs in the private sector. Additionally, it will develop roads and other rural infrastructure to facilitate improvements in access to markets. A core partner on the programme is ACE, responsible for grain marketing support.[362]

Private sector and NGO interventions

Partner (Private)	Role
Seed Co Ltd. Malawi	The leading certified seed company authorised to market seed varieties developed by itself, government and other associated seed breeders. The Company is involved in the breeding, multiplication and distribution of mainly hybrid seed varieties multiple crops. https://www.seedcogroup.com/
Multiseeds Company	Production and marketing of seeds http://www.musecomw.com/
Funwe	Production and marketing of high-quality certified seed and other inputs. Market >100,000 Malawian smallholder farmers. http://www.funwefarm.com/
Global seeds	Production, marketing and distribution of improved, certified seeds for sale to smallholder farmers at affordable prices. https://globalseedsmw.com/
Demeter Agriculture Ltd (Subsidiary Farmers World)	Production and marketing of fully certified seeds. Seed is produced on the company farm as well as by selected out-growers enabling the highest industry standards to be achieved. All seed produced is government certified. Seed is processed, treated and packed at the facility in Lilongwe before being distributed through networks of outlets, as well as other reputable distributors. http://www.farmersworld.net/| https://demeterseed.wordpress.com/about/
Transglobe Produce Exports Ltd	Agricultural exporting arm of the Tayub corporation. The firm exports locally grown produce. ---
Bridge Shipping Malawi	Providers of warehousing and freight clearing/forwarding for general cargo and other agricultural commodities from Malawi. https://southern-africa.steinweg.com/en/bridge- offices/africa/malawi/lilongwe/
Sunseed Oil Ltd (part of Globe Group conglomerate together with CP feeds)	Leading cooking oil manufacturing Company in Malawi with state-of-the-art factory. The company extracts and refines oil from locally grown soybeans and sunflower. Focused on value addition and agro-processing (oilseed products cluster - cake export and cooking oil exports). http://www.globegroup.mw| http://www.sunseedoillimited.com/about.html
Farmers World	Farmer's World (Inc. Agora) agrodealers supply agricultural and building products: fertiliser to seed, chemicals and building supplies to high quality bicycles etc. Also offer agronomic extension services to all customers. http://www.farmersworld.net/

ETG Export Trading Group	ETG agents reach deep into remote agricultural regions to procure produce from smallholder farmers through strategically located centres. These are then aggregated at ETG warehouses and/or transported to processing facilities. http://www.etgworld.com/con tact/malawi/
Exagris AFRICA	Production of commercial seed: specialise in seed production, export crops & agro-processing. Our farms also supply the domestic market. http://www.exagrisafrica.com/
Central Poultry Feeds (CP-Feeds)	Malawi's largest processor and marketer of chicken. Buying soybean grain from farmers, process soybeans into human food and animal feed. https://www.centralpoultrymw.com/
Agriculture Commodity Exchange for Africa (ACE)	Agricultural Commodity Exchange for Africa is a commodity exchange and Warehouse Receipt System operating in Malawi. The Exchange has facilitated finance of over $22m to SMMEs for agricultural produce and traded over 200,000MT of commodities. In recent years, ACE has introduced the Chithumba Model: An Alternative Financing Mechanism. This model was introduced as a solution to challenges faced by smallholder producers. The model seeks to improve productivity, provide access to credit and to link these producers to formal market opportunities. As such, ACE provides soybean producers in Lilongwe, Mchinji, and Ntchisi with different service packages, including pre-harvest finance for farm inputs, agricultural extension support, and marketing assistance. Unfortunately, though this represents an attractive concept, the model was faced with various challenges that hindered adoption by producers: trust issues and a poor understanding of the model. Future interventions must seek to reduce the cost of loans and inputs. http://www.aceafrica.org
NASFAM Commercial	NASFAM Commercial provides services to the NASFAM system in terms of commodity trading, product development and commercialisation, marketing programmes, wholesale and retail sales, crop financing and input supply. NASFAM Commercial maintains separate operational and financial systems which are tailored to business operations. www.nasfam.org
Rab Processors (Incl. Kulima Gold)	Leading actor: value addition and trading of locally grown produce and inputs through Kulima Gold Depot networks: Provides a vital market to farmers selling produce; and producer of nutritional, fortified food products in Malawi; agro-processed commodities include milk powder, tea bags, peanut butter, nutritional supplement goods and salt; locally grown, non-processed food products: maize, groundnuts, rice and various types of beans (e.g. soy), 15% are for the export market; and Key regional supplier of basic non-food household and agricultural items fertiliser and bicycles. https://saiia.org.za/saiia-toolkit/rab-processors-ltd/

Partner (NGO/CSO)	Role
LUANAR - Centre for Agricultural Research & Development (CARD)	The Centre for Agricultural Research and Development (CARD) is a research Centre of the Lilongwe University of Agriculture and Natural Resources (LUANAR), University of Malawi. It undertakes cooperative research, consultancy and outreach/training in which LUANAR, Government, NGOs and other cooperating bodies and participants are co-explorers in search for innovative policies and strategies geared towards the promotion and transformation of agriculture and rural development. http://www.luanar.ac.mw/card/
National Smallholder Farmers Association of Malawi (NASFAM)	The National Smallholder Farmers' Association of Malawi (NASFAM) is the largest independent, smallholder-owned membership organisation in Malawi. It is founded on the principles of collective action and is democratically governed by its members. In this respect, it is responsible for production of quality declared seeds and linking farmers to markets. http://nasfam.org/

Seed Trade Association of Malawi (STAM)	The apex body of seed companies responsible for promoting the use of improved seeds to achieve high productivity for food and cash and ensure consistency and reliability in the supply of high-quality certified seed to farmers. Partners with SADC Seed Centre. Comprises 24 seed companies, 20 are national and 4 multinational. Comprises big, medium and small companies (producing <500, >500-1000 and >1000 T/annum). Responsible for oversight of seed production and quality management/ development with partners. http://www.seedtrademalawi.com
Farmers Union of Malawi (FUM)	Provide extension and market advice to farmers, as well as representing traders and processors. More oriented towards linking with markets, cooperative formation and business environment issues. Face financial constraints and need to develop a deeper understanding of agribusiness management to provide farmers with updated training on how to manage and use input-output information systems. www.farmersunion.mw
Civil Society Agriculture Network (CISANET)	The Civil Society Agriculture Network (CISANET) is a grouping of civil society organisations to facilitate the engagement of the civil society organisations (CSOs) working in the agriculture sector with Government over policy issues affecting the sector. http://www.cisanetmw.org/
Food and Natural Resources Policy Analysis Network (FANPARN)	he Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) is an autonomous multi-stakeholder driven network that was formally established in 1997 and mandated to work in all African countries to generate and promote independent research evidence to inform food security policies. www.fanrpan.org
Southern African Grain Network (SAGNET)	A regional network of grain value chain stakeholders from Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. The group guides policy advocacy, capacity strengthening and market information. ---
Regional Network of Agricultural Policy Research Institutes (ReNAPRI)	Comprises national agricultural policy and research institutes in the Eastern and Southern Africa (ESA) region. Created to enable institutions to effectively coordinate with each other, share data, collaborate on providing solutions to the common challenges facing the ESA region, and enable national policy makers to learn from the experiences of other countries within the region. http://www.renapri.org/
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	Research institution/ NGO, responsible for development and multiplication of certified seed. The Malawi Seed Industry Development Programme (2008-Present) improves quality of seed for smallholders and engages with NASFAM. Seeds are certified and sold commercially under an umbrella brand, the Malawi Seed Alliance (MASA). https://www.icrisat.org/
International Food Policy Research Institute (IFPRI)	Conducts evidence-based research and advises government and development partners on strategic policy options to support agricultural development and economic growth, promote food security, and support broad-based economic growth. Strengthening agricultural markets and institutions; Social safety nets and breaking the humanitarian cycle; and Priorities for agricultural investment. https://www.ifpri.org/program/malawi-strategy-support-program
Famine Early Warning Systems Network (FEWS NET).	FEWS NET is a leading provider of early warning and analysis on acute food insecurity around the world. The body also monitors trade and product flow. https://fews.net/

5.2. Constraints and Potential for Growth

5.2.1. Current Constraints

Low productivity

The lack of scale and mechanisation in soybean production is one of the key bottlenecks preventing growth. This is also a key factor in the poor functionality of commodity exchanges since they require larger volumes in order to work effectively.[363] Low productivity has multiple causes:

- Inputs: Despite recent efforts to develop and introduce improved seed strains, if these are not made accessible to poorer households through effective pricing and technical extension, they will not be adopted. Poor seed quality, availability, and price remain limiting factors for >50% of producers.[364] Additionally, smallholders face challenged accessing inoculant and fertiliser at prices that they can afford.[365]
- Poor practices: Poor agronomics are an ongoing challenge for producers. This includes a lack of adherence to best practices despite extension efforts.[366] This also makes smallholder's crops more susceptible to various pests, diseases and the impacts of climate change: Soybean rust and other diseases; Leaf eating caterpillars and leaf rollers; as well as drought (terminal and low moisture stress); Poor soil fertility (low P).[367]
- Land constraints: A combination of small land holdings and ownership disputes cause added challenges for producers. For upstream actors, there is a need for more seed multipliers who can operate on medium to larger scales in order to meet local demand. For producers, the ongoing trap of subsistence vs commercialisation is tied to the aforementioned barriers (inputs and practices) and individual households are forced to make decisions regarding land utilisation: food consumption and cash outcomes. Though operating on small land areas does not always mean low productivity or profitability, there is a need for producers to better understand the need for crop coordination in a way that maximises profitability as well as productivity of maize. Such challenges are mitigated in neighbouring countries by the increase in large-scale production.[368, 369, 370, 371, 372]

Linking producers to market is a key challenge. Smallholders lack marketing power, information and face high trade costs as well as price volatility at farmgate.

Access to markets

Linking producers to market is a key challenge. Smallholders lack marketing power, information and face high trade costs as well as price volatility at farmgate.[373], [374] There is also a distinct lack of infrastructure and organisational capacity in the majority of cases, comprising quality and highlighting the need for greater formalisation of market linkages.[375] Larger-sized actors (including both producers, traders/aggregators and processors) typically exhibit the capacity to access up-to-date or real-time market information and pricing (e.g. Commodity Insights Africa). In contrast, smaller-scale producers typically struggle to access reliable information, and this leads to them being exploited by traders and aggregators in rural areas, who take advantage in terms of the prices they offer. Therefore, targeting these issues within the value chain from a market-oriented focus or M4P approach can help to resolve some of these barriers to inclusivity within the value chain.[376]

Domestic trade and export challenges

As aforementioned, export procedures present multiple challenges even for experienced, larger companies: with multiple documents required for export, cumbersome procedures, high transport costs and a myriad of further macroeconomic factors (e.g. negative influence on pricing). However, within Malawi, access to domestic supplies is also heavily controlled/ overseen by authorities, through the issuance of local buying permits and roadblocks hinder the ease of moving of goods between districts. Therefore, export barriers include, both domestically and for exporters. Domestic prices are market determined but are subject to high volatility as they are affected by sudden interventions by government, like currency devaluations,

unpredictable imposition and lifting of export bans at harvest time, issuing minimum farm gate price regulations, or banks charging extremely high interest rates on commercial loans. Additionally, challenges also arise due to both Tariff barriers and non-tariff barriers.[377] Non-tariff barriers are more likely to pose real roadblocks for exports of soybeans from Malawi. On a higher level, macroeconomic developments affect the performance of soybean exports as they compete against cheaper products from other competitors (e.g. South African produced soy). High inflation, currency devaluation and at times, appreciation lead to weekly changes in the competitiveness of Malawian soybeans and the high interest rates seen domestically make it difficult for downstream businesses to store or make forward contracts for trade in advance.

These challenges compound with the extreme volatility of soya prices. Cross-border trade is hindered by unavailability of accurate and instant pricing data, as well as unexpected costs that arise during transportation, sale, and marketing. Although SADC policies exist to facilitate trade, soya stakeholders in Malawi report that they are largely unsuccessful and that 'hidden' costs and challenges pose great risks to trading soya.

Recommendations to engage with ACE's Structured Trade Taskforce and to consider the provision of mobile/ICT service delivery for instant pricing data and extension services address these concerns (see "Recommendations" section)

5.2.2. Options for Growth

Increased yield

Soybean shows great scope for improvement as current yields are relatively low and challenges (namely lack of access to farm inputs, credit and storage infrastructure) are largely in production rather than markets or demand. As such, there is the potential to increase the volume, value and quality of soybeans produced without dedicating additional land to the crop's production. Yield may be improved through increased access to relatively low-cost interventions such as: High quality inputs including quality seeds, fertiliser; Information on better technical practices for cultivating and harvesting soybean plants.

In the long term, if sufficient volumes are produced and following the creation of additional processed goods from soybean, Malawi might expand into more competitive markets outside of Africa.

In the long term and on a larger scale, high value capital injections are needed to improve the general infrastructure of the value chain, thus improving yield, including improved infrastructure for the storage and transport of soybeans. All these interventions are dependent on access to capital and finance.

Further development of value-added soybean products

Revenues gained from soybean would be augmented by further developing processed goods from soybean, such as meal and edible oil. These goods would be marketable to both the domestic market for consumption and for the livestock sector.

In the long term, if sufficient volumes are produced and following the creation of additional processed goods from soybean, Malawi might expand into more competitive markets outside of Africa. Malawi's GMO-free soybean brand is valuable and will be even more marketable once offering a range of finished goods from the crop.[378]

5.3 Potential for Interventions by FinMark Trust

5.3.1 Most Significant Interventions Needed

Increased access to seed

In recent years, a range of projects have focused heavily on improving the biological components of seed as well as value chain mechanisms that guarantee the trackability and affordability of seed, and for good reason – access to quality seed remains a key constraint

on the soya value chain. Feed the Future represents one of the actors in this space. However, there is room for expansion upon this work; many farmers still resort to the use of low quality and recycled seed due to lack of access, information, or finance to purchase higher quality seed inputs.

In a review of the financial products offered in Malawi, Opportunity International found that loans and financial services for seed-related activities were specifically lacking.[379] Private agro-dealer companies like Seed Company Malawi (Seedco), Farmers' World, and Rab represent some of the largest private actors providing seed.

Increasing access to seed and other high quality farm inputs will require improved access to credit; the recommendations for FMT to strengthen value chain actors' capacity to access traditional means of lending and to support the creation of credit reference profiles offer solutions to increase access to capital for seed.

Improved and increased high-yield varieties

In addition to increased seed availability, encouraging the development, acquisition and planting of scientifically improved varieties offers a viable solution to the low yields experienced by soya farmers. This intervention is particularly salient given that Malawi experiences limited land, so improving yield for existing lands remains more practical than expanding into new hectares.

It is important to note that soya farmers are often intercropping soya with groundnuts, maize, cassava, and other cash or food crops. Naturally, farmers are likely to make their land allocation decisions based on factors such as which crops receive the highest prices and price-to-input cost ratio, and which crops experience the highest yields and least losses. Improving varieties to fit these characteristics will improve the cost-benefit analysis for soya and incentivize farmers to increase their production.

Expanded market linkages

The way that markets are structures in Malawi has allowed the traders and aggregators to take advantage of these poor market linkages by making excessive profits at the cost of the SHFs. To mitigate this negative price impact on smallholders, market linkages with the SMEs and processors need to be improved. Increased market linkages may also lead to improved access to finance for smallholders and SMEs.

Increased contract farming arrangements offer a potential solution to facilitate these linkages by providing security to encourage buyers with increased incentive to provide credit, improved seed and inputs, and technical advising to farmers to ensure that the soya produced matches quality expectations.

5.3.2 Scope for Synergies with Interventions by Other Players

GIZ KULIMA 'More Incomes and Employment in Rural Areas (MIERA)

Combines 3 intervention areas: Strengthening of Service Provision, with a focus on the promotion of access to innovative agro-inputs; Partnerships and Stakeholder Inclusion, with a focus on scaling up and replicating inclusive business models; and Strengthening the role of farmer organisations and MSMEs (small scale informal commodity traders, informal agro-dealers and micro-processors) operating in the value chain. The programme seeks to facilitate increased availability of appropriate inputs at farmer level and stimulate the uptake by smallholder farmers; develop and disseminate improved agricultural practices; take inclusive business models and contract farming models to scale and replicate the models with other partners; provide support to MSMEs to help improve the efficiency of transactions and improve the quality of crop available to the market; support the Commercialisation and uptake

of structured storage and trade services; support the formalisation of agro-dealer operations through their integration into lead companies' business models; and provide improved access to business and financial support for farmer organisations and MSMEs operating in the value chain to strengthen their role.

Soil Food and Health Communities Project (SFHC) (2000 – Present)

Established to help address high rates of child malnutrition and to provide smallholders with alternatives to expensive, inorganic fertilisers. As such, the project utilises farmer-led participatory research, ecological approaches to farming, local indigenous knowledge and democratic processes to build healthy, equitable, and resilient smallholder communities.

AGRA

Supporting development of soybean VC by promoting the availability of high-quality seed to farmers, through development of the agro-dealer networks.

Presidential Initiative for Poverty and Hunger Reduction (PIPaHR)

Promotes soybean production and trade. The PIPaHR is promoting agro-processing and value addition by prioritising in soybean, groundnuts, sugar beans, pigeon peas, cassava, rice and sunflower. The Initiative also promotes the development of cooperatives as business units, for example building the capacity of the cooperatives to enable them deal directly with large trading organisations (Mapping Exercise for Soybean in Malawi).

USAID Feed the Future Integrating Nutrition in Agricultural Value Chains (INVC)

Promotes soy production and developing the soybean value chain in a number of districts in Malawi. By working with the private sector, including processors and exporters of soy-based, the Programme would sustainably develop the soybean value chain through private sector involvement.

6. RICE

6.1. Current Status of the Rice Value Chain

6.1.1. Primary Production

Internationally, rice is the world's most important staple crop, contributing to the food security of over half of the world's population. Populations which rely heavily on rice for sustenance are concentrated in low and middle income countries, including Malawi.[380] In fact, rice is the most rapidly growing food source in Sub-Saharan Africa (SSA); in the last 40 years, rice consumption across SSA has increased at an average annual rate of 4.52%, which is higher than both production and population (3.23 and 2.9% respectively).[381] Rice is thought to be a particularly relevant staple crop in Malawi as it is consumed as a complement or alternative to maize. Given the country's over dependence on maize, the intensification and increased productivity of rice cultivation could be an effective diversification strategy.

Rice is thought to be a particularly relevant staple crop in Malawi as it is consumed as a complement or alternative to maize. Given the country's over dependence on maize, the intensification and increased productivity of rice cultivation could be an effective diversification strategy.

Geographic growth and productivity

Rice (Oryza sativa L.) is a tropical plant and thrives in hot and warm climates and is widely grown across Malawi, predominantly concentrated along the western shores of Lake Malawi (Nkhata-Bay, Karonga, Salima and Nkhotakota), Bwanje Valley in Ntcheu, and around Lake Chilwa spanning from Zomba, Phalombe, and Machinga districts. Rice also serves as an important food and cash crop in the Eastern Bank of Lower Shire Valley in the south. In Nkhata-bay, Karonga and Zomba, rice is a significant income yielding cash crop.[382] Although grown in rural areas, rice is largely consumed in urban centres in Malawi.

Upland rice, grown on dry soil rather than in flooded race paddies, is grown along the smaller rivers flowing into Lake Malawi. In addition to rice fields, shallow wetlands known as dambos are also suitable for rice production, yet tend to result in lower yields than irrigated fields due to short and irregular rainfalls; grain yields in rain-fed upland are below 1 tonnes/ha, compared to an average of 4.5 tonnes/ha for irrigated rice. At the present rates of technology and agricultural sophistication, rain-fed rice yields 1,000-1,500 kg/ha against a potential of 3,500-4,000 kg/ha. Meanwhile irrigated rice yields 4,000 kg/ha against a potential of 6,000 kg/ha.[383] Where sufficient rainfall is available, some farmers are able to grow two harvests per year by growing an irrigated crop during the dry season winter.[384]

Temperatures across Malawi vary little between seasons; in most areas, the diurnal variation between midday and midnight is larger than the variation across seasons. Altitude and temperature are closely related with lower areas experiencing higher temperatures than mountainous zones. The lakeshore and large areas in the Shire Valley in the Southern Region benefit from both warm temperatures and high precipitation levels, leading productive rice cultivation to be concentrated in these areas. In areas with lower precipitation, maize and other crops are preferred for their lower water intakes.[385]

Local, aromatic varieties of rice known as Fava (small grain rice) and Kilombero (longer grain rice) are largely cultivated. Kilombero rice, a long-duration (130 to 150 day growth cycle) variety grown during the rainy season and grown predominantly in the Karonga District,[386] garners high market demand due to its longer grains and appealing aroma.[387] Pussa and TC10 (a category also known as Taichuni including other varieties like kidney and Amanda rice) are the other two most popularly grown varieties.[388] These four varieties are the most widely known options; a 2019 consumer preference survey indicated that 99% of surveyed consumers knew of the Kilombero rice type, 77% were aware of the Faya type, 64% were aware of Pussa, and 13% were aware of TCG10. Brown rice had notably low consumer recognition, with only 10% of respondents being aware of brown rice as an option.[389]

Production trends

Since 1975 Malawi has seen fluctuations in rice production, in both the area utilised for production and yield per hectare of crop, and the quantity produced has been lesser than the market and national demand. As such, the country relies on imports to overcome the deficit, and does not consistently export rice to any international markets.

In a 20-year period leading up to 2014, rice production in Malawi doubled from 60,000 tonnes to nearly 120,000 tonnes, an increase attributed to the area of rice cultivation growing from 30,000 to 60,000 ha. However during the same time, the average yield increased by less than 20%, from 1.6 ton/ha to 1.9 ton/ha. The present lack of productivity represents room for expansion, and there is potential for the total production to rise over 200,000 tonnes per year with appropriate interventions and improved agricultural practices.[390]

From a sample period of 2001 to 2005, the average annual milled rice production was 49,990 metric tonnes. Growth rates for yield, harvest area, and production were -11.79%, -5.88% and -16.97% respectively. In the same time period rice consumption grew at a rate of 8.53% and the country had a self-sufficiency ratio of 0.97, indicating that imports accounted for 3% of consumption.[391]

More recently, Malawi's 2018 production of rice was measured around 112,000 tons representing a decrease from 2017, attributed to persistent drought and floods caused by El Niño in the 2017-2018 growing season.[392]

Consumer preferences and demand

Rice's primary purpose is as food. Other uses include as animal feed and in industrial applications including for fuel. In Malawi, there is growing demand for animal feed as a result of growing demand and the gradual expansion of the livestock sector, as well as increased human consumption of livestock products (such as meat, eggs, dairy) due to population growth.

Consumers' preferences for rice varieties for eating are very diverse; as such, there is no ubiquitous way to evaluate rice grain quality. The quality can be inherent to the crop of rice, or can be superficially manipulated by labelling, packaging, and milling strategies. The visual appearance of the grain, such as shape, size, colour, cleanliness, and consistency of grains in a package, also play into perceived grain quality. Aroma and ease of cooking also impact preference, although not in a uniform way: some consumers prefer an aromatic variety while others see aroma as a sign that rice has diminished in quality. Finally, as a processed and often packaged good, the rice's brand (including brand recognition) and packaging also impact customers' preferences and purchases.[393],[394]

Of 890 consumers surveyed, a notable majority (79%) expressed a preference for Kilombero rice, indicating that its optimal aroma, enjoyable taste, easy cooking, grain size, whiteness, and low cohesion after cooking made it the best variety. The same study found Faya to be the second most favoured variety, with 14% of respondents choosing it as their favourite. The remaining 7% was shared among other rice varieties including TC10, Pussa, and Amanda.[395]

Local varieties were seen to be favoured over hybrid and imported, with 80% of consumers indicating that they preferred varieties of rice grown in-country. This preference was attributed to the imported rice varieties having lesser effects on appetite through aroma and taste; consumers specified that although attractive in appearance, imported rice varieties were non-aromatic and tasteless.[396]

Rice Irrigation Systems

Some notable irrigation schemes in Malawi are Limphasa and Hara in the northern region, and Domasi, Muona and Nkhate in the southern region, although many others exist across the

country. Around 15 total irrigation schemes were built in the 1960s-1970s with financial support from international donor agencies, namely those of the Taiwanese and British governments. These schemes were updated under the World Bank's 2011-2014 Irrigation Rural Agricultural Development Project (IRLADP).[397] While estimations vary, it is thought that only around 15% of rice fields are irrigated, with the other 85% being rain fed upland or rain fed lowland.[398]

Smallholder Rice Farmer Population

Some of the most reliable data on the smallholders who farm rice comes from Before et al.'s 2017-2018 growing season survey of farmers in the Nkhulambe Irrigation Scheme in Phalombe, southern Malawi. Although limited to one geographic location, the survey offers insight into the social and economic conditions for Malawi's rice farming population. Of the 234 farmers cultivating 285 hectares (of the scheme's 491-hectare total area), 70 smallholder farmers were randomly sampled. These farmers had an average holding size of 0.4 hectares, and 48.6% had less than one hectare of land. Results for the categories of gender, age, marital status, highest level of education, and primary occupation are listed in Table 77.[399]

Table 77: Socio-economic characteristics of sampled farmers (2017/2018)

Characteristic	Variable	Number of Farmers	Percentage (%)
Sex	Male	29	41.4
	Female	41	58.6
Age	<25y	2	2.9
	26y – 29y	14	20
	30y – 35y	35	50
	36y – 45y	14	20
	>45y	5	7.1
Marital Status	Single	3	4.3
	Married	56	80
	Divorced	5	7.2
	Widowed	6	8.6
Primary Occupation	Farming	69	98.6
	Business	1	1.4
Education	No Education	12	17.1
	Primary School	52	74.3
	Secondary School	5	6.2
	Adult Literacy	1	1.4

Table 77 indicates that women represent a majority of the farmers in the scheme (58.6%) which may be due to the fact that many men are involved in fishing and other income generating activities in nearby areas. The largest portion of the sampled population are between 30 and 35 years old (50%) with very few being over 45 or aged 21-25 (7.1 and 2.9% respectively). An overwhelming majority had accessed either no education or only primary (a cumulative 91.4%).

The study also offers qualitative observations, including corroborating the claim that farmers are using sub-optimal, recycled rice seeds, and that low incomes and limited access to capital prevents farmers from investing in improved productivity measures.[400]

6.1.2. Access to Capital and Financial Services

Rates of access

While smallholders are crucial to Malawi's economy, with over 1 million people being employed by just around 40% of the country's small and medium enterprises (SMEs), they lack access to capital from financial institutions and thus their options for growth and improvement are constrained.[401] Despite agriculture's significant contribution to Malawi's GDP, less than 5% of local lending is allocated to agriculture.[402] While 42% and 12% of urban and rural adults respectively use formal financial services, farmers are amongst the least banked in Malawi.[403]

Borrowing capital is a strategy many healthy businesses/SMEs will employ over the lifetime of their business; without capital injections to enable growth, the cash flows of businesses will reach a certain maximum and may not realise their full potential. For example, differentials in rice prices for irrigated versus rain-fed rice are well documented, and farmers who are not able to access capital to invest in irrigation will be constrained to the lower price bracket. Despite the misconceptions of some financial institutions and actors, borrowing does not indicate that a smallholder has failed or operates an unsuccessful or unsustainable business.

While financial institutions that are willing to provide funds to smallholders do exist, most rice farmers cannot meet the institutions' lending requirements. Many SMEs are unable to provide collateral or security and audited financial statements for their small businesses. Some other documentation requirements of the major banks in Malawi include cash flow projections, bank statements, personal statements from members or directors, debtors' lists, brief management profiles, copy of lease or title deed for land, or valuation reports. At least two of Malawi's major banks require that entrepreneurs bank with them for at least 6 months prior to applying for a loan.[404]

The small number who are able to access credit are subject to high interest rates which stifle growth, and oftentimes commercial bank loans offered to SMEs have extremely limited periods making it difficult for SMEs to pay off any significant investment.[405]

A 2012 FinScope study indicated that 31% of SMEs were formally involved with a financial system, while 59% were excluded from financial services. The remaining 10% relied on informal services. Only 22% of these SMEs were banked. Over three quarters of SMEs avoided borrowing funds because they doubted their ability to repay the loans (often subject to unreasonable interest rates and limited time periods). Of those who were able to borrow, they relied primarily on informal credit systems (often at interest rates above the market rates). Many but not all SMEs surveyed are agricultural.[406]

Profile of existing institutions

According to the Reserve Bank of Malawi's Financial Supervision Annual Report (2015) banks are in theory the most important source of external finance for SMEs, especially in the forms of business loans and overdrafts. The most common sources of capital for Malawi's SMEs, including rice farmers, include owner's capital largely gained out of savings, retrenchment pay-outs, selling off assets, friends and family, micro-finance institutions, and informal investors. Bank loans and overdrafts are less accessible than these more common sources.

According to the same Malawi Banking Industry Report, at least ten commercial banks are licensed in Malawi providing a wide range of commercial banking services. These include: accepting deposits in the form of demand, savings, and time; foreign exchange services and provision of short- and medium-term credit facilities; and financing for international trade. Of these banks, only four are listed on the Malawi Stock Exchange: Standard Bank Limited, National Bank of Malawi, NBS Bank Limited, and First Merchant Bank Limited.

Leasing and Finance Company of Malawi (LFC) provides asset financing services to households and companies to aid in the purchase of motor vehicles, machinery, or other capital goods. One discount house exists in the country — First Discount House Limited — with the principal function of providing liquidity to the secondary market for government bills and registered stocks by purchasing/selling these financial instruments.[407],[408] As of 2017, there were 30 Savings and Credit Cooperatives (SACCOs), 10 of which operate in rural towns. 14 registered microfinance institutions (MFIs) and 8 payday lending companies (PLCs) serve 17% of adults. Two mobile network operators, TNM and Airtel, offer mobile banking services in the form of basic money transfers and no interest savings, which are effective for the transfer of money but not optimal for long term savings. An estimated 1.1 million Malawians belong to Informal Community Based Financial Organisations (CBFOs); 47% of these participants are thought to be women.[409]

6.1.3. Value Chain Actors and Status

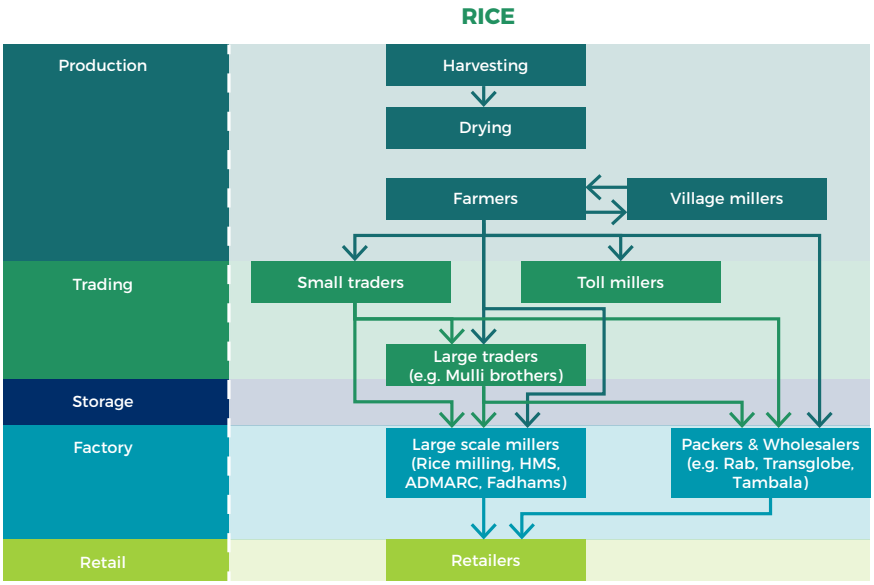
Upstream and downstream actors

Smallholder farmers often cultivate rice under irrigation in rice schemes, and in wetlands during the rainy season. The average land holding for these smallholders is roughly 0.4-0.6 hectares, and many farmers grow rice as a secondary crop to maize, either as a staple or cash crop.[410] Around 300,000 farmers produce rice and cover a total of 60,000 hectares of land. It is estimated that the country has a total of 70,000 hectares suitable for rice farming, indicating that an additional 10,000 hectares could be utilised for rice production if barriers to expansion are eliminated.[411]

In addition to independent smallholders, groups or associations of farmers can leverage their collective resources to cultivate rice as an industrial crop. In these instances, it is more frequently grown for income generation (as a cash crop) than for local consumption for nutrition or food security.

Makoko provides a helpful value chain map model, represented by Figure 55, showing the "channels through which rice moves from the farmer to the final product".

Figure 55: Conceptual framework of Malawi's rice value chain



Source: Makoko (2018)[412]

Input suppliers are important to the rice value chain, contributing to the production stage of the value chain as pictured above. Key input suppliers include Agricultural Development and Marketing Corporation (ADMARC), Agora Ltd, Smallholder Farmers Fertiliser Revolving Fund of Malawi (SFFRFM), and Farmers World.[413]

Middlemen, also known as middlemen vendors, receive orders for rice from buyers, aggregate the orders, and use those calculations to determine how much bulk rice to purchase from the smallholder farmers. Usually when the rice is purchased it has been harvested and dried by the smallholder or association of smallholders. Rather than having permanent locations, middlemen will buy and sell rice from various market points based on availability and optimal prices. Oftentimes, middlemen will buy large quantities of rice and hold the rice through market fluctuations until selling prices improve. Middlemen with more disposable income and access to capital are able to make these strategic purchases and hold them more comfortably, while those with less capital will need to buy and sell rice more quickly to turn a profit. This category of 'middlemen' can include small and large traders, toll millers, large millers, or large-scale millers.

Middlemen then sell bulk rice down the value chain to processors/packers. These processors operate rice mills to clean, sort, and package the rice. There are two factions of processors: 1) small-scale processors, consisting of one or two rice mills, situated along main roads and 2) larger processors located in urban centres with connectivity to a national electricity grid. These larger scale processors include Mulli Brothers, Rab Processors, Agora Ltd, and Trans Globe, and are concentrated in Blantyre and Lilongwe. They buy from a combination of producers and/or middlemen; purchasing directly from producers is less frequently seen and requires that the smallholder or association of smallholders be located in geographic proximity to the mill.[412] Sometimes, middlemen vendors sell to intermediate buyers (sometimes referenced as 'small traders' when middlemen vendors are referenced as 'large traders'), who act as brokers between the middlemen and larger processors.

Processors either package and market rice themselves (typically larger processors have access to the capital and expertise to do so) and supply it to retailers, or sell their value-added rice to larger brands who market and provide the rice to the retailers. Although not depicted in Makoko's value chain map (which focuses on formal avenues), some rice bypasses the packaging and marketing stages and is instead sold in bulk on the informal market, such as on side streets or in village food markets.

The Government of Malawi (GoM) also serves as an important stakeholder in the value chain, with jurisdiction over policy development and implementation, research, and extension services. The Ministry of Agriculture, Irrigation and Water Development (MoAIWD) is a prominent government actor, with departments such as Agriculture Extension Services; Crops Development; Animal Health and Industry; Agriculture Research; Agriculture Planning Services; Land Resource and Conservation; and Fisheries.

The Ministry of Natural Resources, Energy, and Environment contributes its Department of Climate Change and Meteorological Services, with activities in irrigation; crop production; crop insurance; crop management; early warning systems for food security; and climate risk management. These services are increasingly relevant as Malawi adapts to climatic shocks and the impacts of climate change. Given that rice production occurs primarily in rural areas, the Ministry of Local Government and Rural Development also has potential to be an important actor in future development of the value chain, particularly its Directorate of Local Government Services and Directorate of Rural Development.

Value addition and pricing

Middlemen/vendors tend to dominate the rice market, largely because there is no structured market for the crop. Smallholders have little bargaining power to negotiate for better prices in

the relationship, due in part to limited infrastructure for storage and milling, domestic demands for cash and repayment of informal loans forcing them to sell their rice after it is dried but before it is milled often at below market prices. Malawi has no price controlling mechanisms for rice and vendors are able to set buying prices at their discretion.[415]

Farmers' inability to negotiate prices is exacerbated by the selling conditions — many farmers sell 'at the farm gate', meaning vendors collect rice from the producers. Selling at the gate results in disagreement between farmers and the vendors, with vendors undervaluing the rice (and other commodities) in terms of weight, quality, colour, aroma, etc., leaving the farmer with little if any ability to contest the price offered.[416]

Despite farmers' lower take-home profits compared to middlemen and downstream actors, rice farmers indicate a preference for growing rice to the next-best alternative of maize. The total opportunity cost of growing rice as compared to maize was positive, and measured to be MK72,000 to MK565,848. Local value chain players (middlemen, millers) communicated similar trends stating they would rather invest in rice, at least during the rice season, than any other enterprises as they experience relatively high profits in the rice subsection.[417] Exceptions were the Mphinga, Nkhate, and Lifuwu areas, where rice production required more capital than maize production per acre.

In absolute terms, traders incurred more costs and realised more revenue than other players in the value chain for equal volumes of rice. This is explained by the 'elite' market the traders target and the value addition activities they incur costs for, such as packaging and marketing, which in turn collect higher prices. In relative terms farmers incurred less costs than middlemen, but farmers experience input costs, climate shocks and land ceilings that traders do not, explaining the high revenues ultimately experienced by traders. Table 78 displays average total costs, revenues, and profit percentages of value chain actors. However, interestingly, Makoko's study challenges the notion that farmers have insufficient funds to purchase quality inputs, showing their revenues as higher than total costs and indicating profits.

Table 78: Total cost, revenue, and profit percentage of value chain actors

Value Chain Player	Average Total Cost (MK)	Average Revenue (MK)	Profit as a % of Cost (%)
Farmer	249,188.57	794,000.00	218.63
Middleman	670,871.43	794,000.00	18.35
Trader	1,055,028.57	1,342,285.71	27.23
Transporter	103,571.43	202,857.14	95.86
Retailer	635,085.71	861,500.00	

Source: Makoko (2018)[418]

In Makoko's study, traders' revenues were found to vary based on geographic location; those trading in the Nkhate and Mphinga rice schemes realised higher incomes than other traders (when compared at equivalent volumes). For Nkhate rice scheme this is explained by the higher prices achieved in the urban areas of Blantyre, and for Mphinga rice scheme higher revenues were enjoyed due to the presence of the Hara Cooperative — a milling and packaging factory which adds considerable value.

The relative value addition for each actor can be understood in terms of volumes traded: for example, for a farmer in Karonga, Mphinga scheme to break even they would need to harvest over 1,500 kg of rice and sell their rice at MK128. For the same breakeven, middlemen and traders need to trade on average 736kg and 1,781kg and charge MK318 and MK303 respectively. This explains why rice prices are progressively higher down the value chain as compared to their first point of sale from the farmer.[419]

In 2017, final market rice prices for Malawian rice fell around MK480 per kg, while imported rice had a higher price around MK600 per kg. On an international scale, major cereals have

been produced in excess in recent years, leading to surplus and significantly lower prices in international markets compared to the previous decade. Global production of cereals is projected to further increase by 13% by the year 2027, attributable to new technological advances and management systems.[420]

6.1.4. Environmental Factors

Rice is highly sensitive to climate change and variability, as are maize and legumes — three of Malawi's most important staple crops for food security and nutritional wellbeing. Malawi is one of the dozen countries most susceptible to climate change-induced shocks, and has few resources to adapt to these changes. At present, the food security and livelihoods of 85% of Malawi's population, which is predominantly rural and dependent on low-input, rain-fed crop production, are at great risk.[421]

Rising temperatures

Rice is particularly sensitive to temperatures over 35°C, especially during the flowering stage of growth where even one day of excessive heat can impact the crop, which is becoming a relevant challenge in southern Malawi where temperatures are steadily rising and hot days becoming more frequent. Daytime heat events over 35°C can stunt growth, and warmer daily minimum (usually night-time) temperatures also reduce yields — it is estimated that rice yields decline 10% for every 1°C rise in minimum temperature.[422]

Malawi is expected to become notably warmer — an increase between 1.5°C and 3.5°C is projected by 2050.[423] Both minimum and maximum temperatures are projected to increase, causing more frequent hot days and consistently warmer nights.[424] This pattern is similar to global trends. Rising temperatures and changing weather patterns also pave way for unprecedented natural disasters, which can at best disrupt and at worst entirely destroy crops for one or multiple growing seasons.

Water input demands

Rice is a heavily water-dependent crop, requiring substantially more water than maize or other cereal crops grown in Malawi. Rice can require between 450 and 700mm during its growing season or between 900 and 2,250 mm/day depending on its variety.[425] Lack of water can heavily stress the plant, particularly during translating and reproductive life stages.

In the southern and central regions, seasonal rainfall is highly volatile, and the dry season of mid-January to mid-February is seen to be increasingly drier, with the following rainy season being both shorter and delayed. If such a dry spell occurs during the flowering stage of rice production, the crop risks being poorly established and having extremely or non-existent low yields.

In northern areas of the country, declines of precipitation have been observed, especially in March and April. While the total amount of rainfall is still sufficiently high, fewer cloudy days and more sunny, hot days are being experienced.

Models and predictions for changes in rainfall are less consistent than for rising temperatures; when four models were utilised to model future precipitation, two of the four models (ECHAM and HadCM3) predict a slight decline (around 150 mm in a growing season) by 2050, with larger declines near the lakeshore. The other two models (CCSM and CSIRO) predict that precipitation will increase by a similar value, but will decline in certain regions including along the northern lakeshore.[426] Unreliable estimations 1) illustrate how difficult it is to anticipate climate change-related water availability in advance, and 2) underscore the challenges farmers have adapting to climate shocks with both information and capital constraints.

Climate change mitigation strategies, including clean energy

A 2014 crop-climate simulation[427] conducted by the Global Centre for Food Systems Innovation uncovered the following points regarding management practices to mitigate the risks of climate change:[429]

1. Rice and maize yields can attain high levels and respond well to fertilisers in areas with sufficient rainfall and moderate temperatures (like the northern and central regions). Leaching of nitrogen during high precipitation years reduces yields, particularly under low nitrogen applications, implying that multiple doses of fertiliser and other soil fortification methods ought to be used throughout the season.
2. Water deficits constrain yield in areas with lower rainfall and warmer temperatures. And yields are highly varied. Fertiliser response rates are much lower under these conditions. The yields of these areas and fertiliser response rates could be improved with irrigation during the rainy season, but the warm temperatures may still cause limitations.
3. Climate change effects for rice and maize are very real, with hot temperatures directly lowering yields. There are few management tactics that could reduce the harm of hot temperatures; selecting less-sensitive varieties remains the foremost viable option.
4. Winter rice production depends almost exclusively on irrigation, and plants are particularly susceptible to gaps in water availability during the seedling and flowering stages. Rises in temperature and water demands will be positively correlated. The existing competition for irrigation water will be exacerbated by climate change.

Overall, there is a potential for clean energy use in the cultivation of rice, including to create efficient and renewable-energy based irrigation systems. However, barriers to uptake including lack of electrification, insufficient road infrastructure, lack of available finance and credit, and more pressing needs have prevented clean energy from being a focus in the development of the rice value chain.

Use of Clean Energy

Although the production of rice involves more infrastructure, particularly for irrigation, and there are in theory opportunities to capitalise on clean and renewable energy, little has been seen. The same challenges enumerated in Groundnut also hinder clean energy uptake in the rice value chain.

6.1.5. Institutional Framework

Government policies and legislation[429]

The Government of Malawi (GoM) has not implemented specific policies to support System of Rice Intensification (SRI), defined by the Food and Agriculture Organisation (FAO) as "an agro-ecological methodology for increasing the productivity of irrigated rice by changing the management of plants, soil, water and nutrients" which aims to "promote the growth of root systems" and "increase the abundance of diversity of soil organisms" guided by the overarching principle of creating more outputs from less inputs.[430] The SRI methodology began in Madagascar in the 1980s and has grown in popularity for some Asian countries which grow rice. SRI was introduced to countries in Africa, where initiatives promoting SRI are few and far between despite rice gaining popularity as a major cereal crop for both food security and income generation, between 2001 and 2011.

One of Malawi's most prominent policies in agriculture, the Malawi Growth and Development Strategy II (MGDS) 2011-2016 includes Agriculture and Food Security as an area of focus, with key goals of increasing agricultural productivity and diversification. The strategy names maize as the top staple food for Malawians, therefore defining food security in terms of maize availability and omitting other important food crops such as rice, cassava, potatoes, and

sorghum. The same document states that the agriculture sector "will diversify by promoting wheat, cotton, and coffee and production of fruits and vegetables," again omitting rice.[431]

Rice was mentioned in the Malawi Agricultural Sector Wide Approach: A Prioritised and Harmonised Agricultural Development Agenda 2011-2015 under the focus of Sustainable Water Management and Irrigation Development. It was named as a "high value crops considered a priority" along with "paprika, chillies, green maize, vegetables (cabbage, onion, tomato, garlic, shallot, green beans, carrots, peas), and fruits (banana, pineapple, citrus, mango, strawberry, pawpaw)".[432],[433]

GoM's most rice-centric policy was the National Rice Development Strategy (NRDS), which was implemented from 2014-2018 with the overall objective of increasing rice production and productivity with four specific outcomes:

- To increase coordination and collaboration among stakeholders throughout the rice value chain,
- To enhance the ability of cooperatives to improve farmer livelihoods,
- To support increased productivity for smallholder rice farmers, and
- To develop a strong rice market fuelled by demand and the production of value-added products.
- A second iteration of the NRDS was discussed and researched by GoM in 2019, but no additional strategic documents were released.

Key government programmes and projects[434]

A recent project carried out by the Malawi Ministry of Agriculture, Irrigation and Water Development (MoAIWD) known as the Smallholder Irrigation and Value Addition Project (SIVAP) addressed agricultural productivity and production by intensifying irrigation and crop diversification, with a concentrated emphasis on irrigated rice. The $39M project was supported by the African Development Bank (AfDB) from 2013-2018 and benefitted 656,112 people, 46% of whom were women. 2,210 hectares of land were outfitted with new irrigation and drainage systems and 132 hectares of road were improved.

The ministry's ongoing Farm Input Subsidy Program (FISP), which has targeted food self-sufficiency and income generation for rural poor households since its 2005 inception, provides fertiliser for maize and other cereals including rice.

Key private sector interventions

In addition to, and sometimes in conjunction with, the Government of Malawi, private sector interventions are enacted by development agencies and NGOs. Some prominent programs which deal directly with rice include:

1. **The Chithumba Model: An Alternative Financing Mechanism:** The Chithumba model is "an alternative finance mechanism implemented by the Agricultural Commodity Exchange for Africa (ACE) and launched in Malawi in 2015".[435] It was conceived to mitigate the challenges smallholder farmers face in respect to low productivity, lack of access to credit, and limited participation in the formal market. The model provides a service bundle of interventions including pre-harvest finance for farm inputs, agricultural extension services, and marketing assistance. Soybean farmers located in the Lilongwe, Mchinji, and Ntchisi districts were the primary beneficiaries in the three-growing-season pilot of the program. However, ACE struggled to encourage farmers to adopt its marketing services during the pilot period, finding a lack of trust and understanding of the services to be a barrier. The loan rates offered were not enticing enough as compared to the rates offered by commercial banks. Despite challenges to implementation, the Chithumba model offers a blueprint for future bundles of implementation, particularly for pre-harvest capital availability, if the inputs can be offered at lower costs and loans at lower rates.[436]

2. **KULIMA – More Income and Employment in Rural Areas (MIERA):** Rice was featured as a selected value chain market, along with soybean, groundnut, cassava, sunflower, paprika/chillies, and macadamia, in the MIERA project (2015-2019). Commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the European Union (EU), MIERA used a value chain approach to support smallholders and MSMEs, particularly in downstream portions of the value chain (processing, marketing). The chief objective was to create more rural employment for smallholders and MSMEs, with a particular focus on female inclusion. Business training and market linkages also feature prominently. Results have included over 900 jobs created; 21,000 smallholder farmers reporting an income increase; more than 400 marketing and contract farming agreements signed between partner companies and farmer organisations, linking farmers directly to better output markets and increasing their access to improved inputs and extension; 22,000 smallholder farmers trained on farm economics, agribusiness and marketing skills and introduced to new farm business management practices such as record keeping or gross margin analysis; and 350 MSMEs participating in the MSME Business Training and Coaching Loop to learn about better processing, business and marketing opportunities, and subsequently tapping into new retail markets for value-added products.[437]
3. **Programme for Rural Irrigation Development (PRIDE)** [438]**:** Implemented by the International Fund for Agricultural Development (IFAD), PRIDE "aims to enhance rural Malawian communities' resilience to food insecurity and the adverse effects of climate change." Activities include developing climate-smart land and water management systems for small scale farmers practicing rain fed agriculture, and irrigated crops; establishing and strengthening the capacity of the Water Users' Association to manage, operate and maintain irrigation schemes for appropriate land and water governance; building smallholders' business capacities; and promoting market linkages for specific value chains. The program's inception was in response to poor irrigation and water storage techniques having negative impacts on agricultural productivity, which is especially salient for rice. The theory of change is that improved access to timely weather information, irrigated lands, agricultural technologies and remunerative markets will improve smallholders' income up to eightfold, and prepare them for the adverse effects of climate change. PRIDE is funded through a grand from IFAD as well as a highly concessional loan, and a complementary grant under the Adaptation for Smallholder Agriculture Programme (ASAP). It anticipates impacting 17,500 smallholder households, with focuses on women and youth led agriculture, from 2015-2023.
4. **Agricultural Productivity Programme for Southern Africa (APPSA):** The World Bank's APPSA program ran from 2013-January of 2020 across Malawi, Mozambique, and Zambia, with a total implementation cost of $94.64M. The program was established to improve agricultural technologies through 1) the establishment of Regional Centres of Leadership (RCoLs) focusing on commodities of regional importance; 2) regional collaboration in agricultural research, technology availability, and training; 3) increased knowledge sharing for agricultural information and technology between participating countries. An end of project evaluation determined that more than 4.6 million people benefitted from the project across the three countries, with a bulk of these (2.4 million) being in Malawi. Results included farmers at Lifuwu Rice irrigation program in Salima district, Malawi, adopting the use one of the new rice varieties known as Mpheta, a rice variety that matures early enabling farmers to plant the crop twice in a year, increasing their yield.[439]

6.2. Potential for growth and improvement

6.2.1. Current Constraints

Many smallholder rice farmers in Malawi find low income levels from rice to be a major challenge, and a barrier to investing in improved productivity, especially when coupled with

lack of access to financial credit/capital based on insufficient collateral. While some agricultural specialists believe rice could replace tobacco as Malawi's number one foreign earner in time, limited production has inhibited this, and low rice productivity has resulted in low contribution of the crop to Malawi's total economic development. Some of the major challenges are as follows:

While some agricultural specialists believe rice could replace tobacco as Malawi's number one foreign earner in time, limited production has inhibited this, and low rice productivity has resulted in low contribution of the crop to Malawi's total economic development

Lack of quality inputs

Production is constrained by lack of access to high quality inputs, including pure and high yielding seeds, fertiliser, and manure. Lack of access to quality inputs is underscored by inadequate access to agricultural credit, output and input markets, and failures in technology transfer.[440]

Olson et al. (2014) uncovered that when certain inputs were accessible in limited quantities, they were sometimes prioritised for the growing of maize rather than rice as maize was thought to be more integral to food security; only 1 out of all 70 farmers surveyed expressed that they had used fertiliser at least once in the previous five rice growing seasons. Qualitatively, farmers indicated that they could not afford fertiliser for their rice crops.[441]

Due to the unavailability of high quality and pure seeds, many farmers use varied, recycled seeds leading to challenges when one cultivation area includes crops of varying ages and rates of maturity and an 'uneven' crop.[442] A lack of quality seeds also prevents access to improved and more robust rice varieties.

Lack of water control also presents challenges given that 85% of rice cultivation relies on rainfall; in areas with longer rainy seasons and sufficient flooding, two crops of rice can be harvested per annum, while drier areas with insufficient rainy seasons only experience enough water to harvest one crop. This risk deters investment and agricultural intensification in many geographic areas.

Farmers have reported direct impacts of water shortages on production; a recent study by Olson et al. (2017) relayed that farmers felt increasing competition for water between upstream and downstream users, due to reduced availability of water resulting from climate change. Olson notes that growers in the Domasi rice scheme in the Southern Region had been forced to reduce their winter production from 75% to a mere 25% of their scheme's land due to lack of water for irrigation.[443] Logically, this represents that at least an additional 50% of land could be operationalised for winter growing if interventions were made to ensure the provision of sufficient water.

Education and entrepreneurial training ought also to be considered as important inputs in business growth. Kalaile (2016) posits that "almost anyone" can create an SME, but very few manage to grow past the initial stages. Kalaile explains two sets of obstacles to growth: environmental factors, and internal or personal constraints largely influenced by education. To the first point, Malawi experiences a difficult macroeconomic environment characterised by high inflation rates, interest rates, volatility of the market, a limited middle class with disposable income, weak industrial base, and heavy dependence on the government.[444]

To Kalaile's latter argument, it is thought that Malawi's education system fails to nurture entrepreneurship in the formative years, limiting farmers' conceptions of themselves as businesspeople and leading to lack of management ability to grow. Farming, including rice farming, requires educational inputs not only on best farming practices and inputs, but also on the legal system, financial management skills, human resource management for farmers who employ labour, and other technical systems. These skills are also pertinent for downstream actors of the rice value chain, such as mill owners and packagers.

Poor agronomic practices

Before Tembo et al. (2018)'s study of 70 farmers in the Plamobe district (southern Malawi) uncovered some poor agronomic practices frequently used by farmers. Insufficient plant spacing was seen: 95.7% of surveyed farmers did not follow any spacing protocol, despite 10 cm being recommended. Some used 'dibbling', where rice is planted in dry soil and no spacing is allowed between plants. Farmers using unspecific quantities of seeds for given areas, rather than methodically applying seeds per area of cultivation, also presented issues for crop production.

A lack of good agricultural practices (GAP) is partially attributable to insufficient access to information. In a survey, 51.4% of farmers indicated that word of mouth information from other rice growers was their primary means of agricultural education, and 34.3% got their information from extension workers in the area. Very few said they learned farming techniques from either radio broadcasting or field days (4.3% and 1.4% respectively).[445] These insights are valuable in determining future best practices for disseminating information to rice farmers.

Continuing education for farmers, often in the form of government and private sector-sponsored farm days and extension worker programs, have been seen as viable options for overcoming poor agronomic practices based on insufficient information. And, financial and digital solutions have been less widely adopted.

Lack of access to financial credit

Perhaps most significantly, lack of access to financial credit inhibits productivity and intensification of the rice value chain in Malawi. Access to finance allows SMEs to develop business strategies, acquire better and lower-labour technology, use high quality inputs, and access new markets. The World Bank's 2009 Enterprise Study revealed that despite obstacles of poor transportation, unreliable power supplies, excessive tax rates, inadequate education, crime, convoluted business licensing protocols, corruption, and limited access to land, a remarkable 45.6% of SMEs claimed that limited access to finance was the leading challenge in operating successful and profitable businesses.[446]

As previously demonstrated,[447] SMEs and smallholders are heavily constrained by lack of access to banking, savings, loans and insurance. With insufficient collateral to obtain loans, and excessively high interest rates when loans are available, financial credit is not an accessible option for growth for many of Malawi's rice farmers under the current conditions. Much of this is attributable to banks' preferences to loan to the government rather than private sector because the perceived risk is lower, and returns are often higher.

With 60% of commercial banks' revenues coming from loans to large corporation clients, 22% from foreign exchange, 15% from investments largely in treasury bills, and 6% from client fees and commissions, banks have little incentive to expand their lending to farmers of rice or other commodities.[448] Banks' lack of accommodation for small businesses has crowded out most private sector borrowers and increased the real cost of capital.[449]

GIZ underscores that there are two major barriers to accessing financial credit for agriculture in Malawi: 1) the cost of finance from the private sector, and 2) an asymmetry of information on accessing alternative financing within the sector. The cost of finance from the private sector refers to interest rates on commercial loans in Malawi, which are significantly higher than in other SADC countries; estimates for loan interest rates range from 20-40%, and some producers have reported rates as high as 55%. Most Malawian farmers cannot access loans at these rates. Secondly, asymmetric information on access to finance prevents potential borrowers from understanding and taking advantage of available options.[450]

In addition to smallholders accessing credit with fair interest rates, other financial constraints include lack of finance, stiff competition for limited funds in the sector, high taxes, corruption

and the expectation of bribes to enter into loan contracts. The dual recommendations to encourage improved access to traditional lending, credit reference profiles, and to facilitate alternative scoring mechanisms for credit assessments all seek to address the barriers to accessing agricultural finance within the rice value chain.

6.2.2. Options for Growth

The rice value chain is somewhat unique within the country in that the challenge is production rather than market failure; there is higher demand for rice than what smallholder farmers can currently produce, and at the same time locally grown rice is preferred by consumers over imported varieties. If production can become more efficient, and therefore more profitable, the value chain is likely to grown and overtake additional markets, leading to less importation of rice.[451] Improving access to credit for farmers to invest in intensifying their rice crops will be an important step towards growth down the value chain.

If production can become more efficient, and therefore more profitable, the value chain is likely to grown and overtake additional markets, leading to less importation of rice.

Improving productivity for existing production with access to finance

Given that access to quality inputs and better agricultural practices both rely on access to capital, increasing availability of credit and financial stability will lead to better outcomes across the value chain. Quantitative evidence showing that as many as 70% of Malawian smallholders, many of whom grow rice as a primary crop or secondary to maize, lack access to financial credit provides reason to prioritise solving Malawi's financial services access problem before any other interventions.

In terms of access to credit, Ndala (2019) makes several recommendations on improving the environment for lending within the agriculture setting. Recommendations include more consistent and widespread enforcement of the Credit Reference Bureau Act of 2010 to help financial institutions identify and fairly lend to creditworthy smallholders; banks softening their adverse risk attitude to loan more generously without being overly dependent on collateral (trusting business cash flows as evidence that borrowers will repay loans rather than demanding collateral); the government considering providing tax incentivise to banks' lending to SMEs; stabilising the economy to ensure lower inflation and interest rates; and creating government policies that would encourage the relevant Ministries, Departments, and Agencies to include SMEs in government contract tenders. More broadly, Ndala suggests that financial institutions ought to rethink their approach to SME banking to change the culture and practices that prevent SMEs from accessing institutions.[452]

Intensifying production

Improving irrigation and land tenure are crucial for growth of the rice industry in Malawi. Malawi has a total irrigation potential of around 162,000 hectares, representing roughly 70% of its arable land; currently, only 2% of arable land is irrigated.[453] Intensifying irrigation could be approached with two distinct methods: providing smallholders with the capital needed to establish irrigation schemes, or some combination of public and private actors combining resources to increase irrigation and expand existing schemes in a more systematic manner.

Capitalising on rice's suitability as animal feed and for industrial purposes, there is an opportunity for rice farmers to shift production towards rice-based non-food products and by-products. This might be a particularly viable option for farmers who continue to produce sub-optimal yields, such as rice with a less favourable colour or higher rates of grain breakage per unit, as standards for non-food rice are typically lower than what consumers demand for eating.

In order for rice farmers to increase their take-home profit, it would be beneficial for them to advance into the milling and packaging downstream activities of the value chain, where most value addition occurs. While most rice farmers harvest and dry their rice before selling to middlemen vendors, access to post-production machinery such as mills could lead to a reorganisation of the value chain in some or all areas of the country. Such a solution would

require in-depth planning and cooperation, and is notably more complicated than improving farmer incomes by increasing production and quality with access to quality inputs and capital.

Expanding access to international markets

If Malawi is able to improve production yield, neighbouring countries offer markets Malawian rice would likely perform favourably in. A 2016 UKAID report assessed the potential success of Malawian rice in three markets: Zambia, Zimbabwe, and South Africa.[454]

In Zambia, roughly 40-45,000 tonnes of rice are produced annually, against an average consumption of 60-65,000, with the 15,000 tonne deficit being made up with imports. All traders and companies surveyed for the report indicated that Malawian rice would perform well in Zambia, as it is similar to Nakonde rice from Tanzania which is in high demand. Kilombero rice specifically was favoured for its apparent quality and its aromatic properties. Faya rice was not as well received given the Zambian specification for 5% broken rice and a preference for rice that is white in colour.[455]

Multiple distribution channels were discussed: through a grain trader, through a wholesale distributor, or directly to a packer. Selling to a grain trader would be the easiest option as the traders deal with a number of down packers, and the traders expressed confidence that they could boost sales if Malawi was able to provide consistent quantities of the rice. A number of companies expressed interest in bringing rice from Malawi into the market, provided that Malawi could commit to producing enough supply. Price will be the key factor of success for rice from Malawi in Zambia; Malawi would need to price rice between $0.5 USD to $0.70 USD per kg to be competitive, which matches the price currently being paid for Thai rice. Kilombero rice would price comparably to Nakonde rice, which sells for $3.30-3.50 USD in the formal market and $2.65-4.40 USD in the informal market.[456]

Differing from Zambia, Zimbabwe produces no rice in country, instead meeting all demand through imports. Despite not producing, commercial consumption of rice is high; in 2015, 255,750 tonnes of rice were consumed, amounting to 16.42kg per capita. Demand for rice consumption is steadily increasing, subject to supply and the availability of foreign exchange given the volatility of Zimbabwe's economy. Asian suppliers dominate Zimbabwe's rice market, and Thailand provided 34% of 2015 import volumes. 15% of rice was imported by NGOs under food security programs and fell outside of the commercial market for rice. Zimbabwe reported importing 2,630 tonnes of rice from Malawi in 2015.

Although many brands are available in Zimbabwe, they tend to be premium varieties such as basmati, generally imported in bulk and packed at local packaging facilities. Bulk rice, which creates jobs along the value chain packaging and marketing the rice, is incentivised with duty free importation while the government charges a tariff of 15% for packaged rice entering the country. Informal markets also trade rice, supplying to around 10 to 25% of the consumer population. When asked about Malawian rice, Kilombero rice was thought highly of. Despite performing well, it was discovered that the price was too high compared to Asian rice.

Given the competitiveness of the Zimbabwean rice market, Malawian producers would be best suited to create relationships with packers who would add Kilombero rice to their existing product offerings rather than creating a new, unknown brand. Given that Asian rice varieties would be the most direct competition, Malawian exporters would need to offer prices around $0.55 USD to be competitive.[457]

Similarly to Zimbabwe, South Africa imports all of its rice, which amounted to over 1 million tonnes in 2015. Almost all of this rice is imported in bulk and packaged at in-country facilities. Thailand and India are South Africa's leading suppliers of rice, collectively accounting for 92% of rice imports by volume, and offer very competitive pricing. There are no tariffs for rice imported into South Africa, so Malawi would not receive any competitive advantage as compared to Asian suppliers.

Compared to Zambia and Zimbabwe, there are relatively few brands of rice available in the formal market. There is virtually no informal trade of rice — an estimated 99% of rice is sold in formal retailers. Most major retailers will have their own brand of rice packaged in country. The South African market for rice favours parboiled rice, with white rice being sold at a 70%+ premium over parboiled. The percentage of the total rice market that Malawi's white rice could occupy is small, and Malawian rice is relatively unknown to South Africans. In South Africa, Malawian sellers would need to overcome the challenge of educating consumers, brand owners, retailers, and packagers before entering into relationships.[458]

In summary, Southern African countries may provide viable markets for Malawian rice in the future, contingent upon improved productivity and intensified production. It is advisable for investments in Malawi's rice value chain to first focus on the production side, with available markets acting as an incentive to strengthen the value chain in Malawi.

6.3 Potential for Interventions by FinMark Trust

6.3.1 Most Significant Interventions Needed

Olson et al. (2018) provides a snapshot of farmers' perceptions of the greatest challenges of rice farming and thus, the areas where urgent interventions are needed. The results from Olson's study, which used a Likert Scale (a five-point scale from "strongly disagree" to "strongly agree") to gauge how strongly farmers agreed or disagreed that a factor was a major constraint on rice yields, are presented in the table below.

Perceived Factor	N	Mean	SE	SD
Access to extension services	70	3.586	0.112	0.94
Access to improved seed	70	4.257	0.107	0.896
Access to fertiliser	70	3.014	0.145	1.209
Access to water	70	3.3	0.128	1.068
Climate change	70	4	0.115	0.963
Crop damage by pests and diseases	70	3.329	0.13	1.086
Damaged infrastructure	70	4.042	0.105	0.875
Poor access to good markets	70	4.357	0.084	0.703

As seen above, most farmers agreed or strongly agreed (ratings of 4 or 5) that lack of access to extension services, improved seed, fertiliser, and water, as well as climate change, pests and diseases, damaged infrastructure, and poor access to good markets inhibited optimal rice yields. Linkages to good and stable markets was seen to be the leading perceived challenge to rice production (mean score of 4.357) closely followed by access to improved seed (mean score 4.257). While stable markets will rely on improved macroeconomic conditions in the country, entities like FinMark Trust have the capacity to create financial interventions to serve farmers' priorities of access to improved seed and other quality inputs.

Olson notes that their findings are consistent with the literature, citing Matto et al.'s 2017 study on the constraints faced by rice paddy growers in India; Matto found that the most major constraints and areas requiring interventions were irregular visits of agricultural officers comparable to Malawi's extension workers (94.44%), lack of technical advice for seed storage (93.33% of farmers), high costs of fertilisers (82.22%), and inadequate supply of loans (80%). Matto notes that 75.7% of their surveyed respondents need the government and other stakeholders to improve access to seeds while 15.7% would prefer improved delivery of extension services. Expanded fertiliser subsidies for rice farmers and rehabilitation of existing irrigation schemes were also noted as needed interventions.

6.3.2 System for Rice Intensification Framework

It would be advisable for FinMark Trust's investment in the rice value chain in Malawi to align with, or at least avoid contradicting, other system of rice intensification (SRI) efforts in the region. SRI initiatives have been fruitful in other settings, touting benefits such increasing yields per hectare by 21 to 105%, increasing income generated per hectare by 59 to 412%, reducing cost of production by 7 to 56%, reducing water input by 24 to 60%, reducing time to maturity by 1 to 3 weeks, and reducing the incidence of biotic pests and diseases by up to 70%. Modifying rice production with SRI methods results in plant phenotypes from given rice genotypes that are more robust and adaptive, and with higher productivity.[459] This effect appears to result from SRI's inducing larger, healthier root systems and enhancing beneficial soil biota.

More than 50 countries across Asia, Africa and Latin America have reported to FAO benefits from utilizing SRI methods.[460] Importantly, these countries have reported positive improvements to the rice value chain even when SRI methods are partially implemented, or implemented for some but not all actors, implying that any level of implementation will reap benefits. Although SRI interventions in Malawi are limited, the system can be highly beneficial in settings where water is limited, including in Eastern and Southern Africa.

Kenya provides a relevant case study on the efficacy of SRI management. A farm survey conducted in Mwea Irrigation Scheme, Kenya during the 2010/2011 and 2011/2012 main growing seasons determined that SRI had increased average yield by 1.6 tonnes per hectare (a 33% increase), reduced seed input requirements by 87%, and reduced water input by 28%. SRI did require a 30% higher labour input as compared to flooded rice paddies in the first year of implementation (towards weeding) but that labour requirement decreased to 15% when farmers were provided rush weeders in the second year. Ultimately SRI yielded a benefit-cost ratio of 1.76 and 1.88 in the first and second years respectively, compared to benefit-cost ratios of 1.3 and 1.35 for flooded areas.[461]

In greater detail, the main principles of SRI, which FinMark Trust could emulate with program interventions, are as follows:[462]

1. Stimulate plant growth by:
    a. Transplanting seedlings when young (ideally 8-12 days old, and no older than 15 days) to preserve potential for growth
    b. Avoid disturbing the roots and transplant swiftly (15 to 30 minutes after extraction from the nursery) without inverting root tips, and plant shallowly (1-2 cm deep)
    c. Create wider spacing between plants, using a square pattern and one plant per 'hill'
2. Enhance the growth and health of roots and soil Biota by:
    a. Keeping soil moist and aerobic, avoiding continuously saturated or flooded soil
    b. Aerating soil frequently
    c. Enhancing the organic matter content of soil by preferring organic fertilisers over chemical, as well as weeding and levelling

For comparison, 'conventional' rice management (not following SRI principles) allows for transplanting seedlings as old as 20 to 40 days, transplanting seedlings in clumps of plants in dense patterns of 50 to 150 plants per square meter, continuously flooding paddy soil with standing water, using water to control weeds, and using chemical fertilisers.

With its guiding ideology of deriving more outputs from less inputs, SRI is compatible with (and sometimes categorised as) climate smart agriculture (CSA).[463] SRI allows farmers to adapt to the growing constraints of climate change by creating more sustainable and sturdy rice crops.

7. RECOMMENDATIONS

Given the limited landscape for agriculture finance in Malawi,[464] the following section includes cross-cutting recommendations informed by consultations with relevant stakeholders. A key piece of information uncovered through consultations was that most smallholder farmers in Malawi grow crops in several value chains rather than specialising in one; therefore, the most effective interventions will address a combination of value-chain specific challenges, creating a more credit-friendly financial environment, and equipping the smallholder to access finance, credit, insurance and extension services for a combination of farm and non-farm activities.

This section provides an overview of most promising stakeholders engaged, as well as several specific recommendations for interventions working with or through these private sector actors. These bespoke recommendations build off of FMT's expertise and approach and are particularly relevant to FMT's supplier development initiative.

7.1 Promising Private Sector Partners

The Imani consultants encourage FinMark Trust to explore partnership with the following actors currently providing programming and facilitating access to agricultural finance within Malawi. These actors have been engaged and expressed interest in creating or strengthening their relationships with FMT to achieve improved access to agricultural finance in the country:

7.1.1 Opportunity International

Opportunity International has invested $190M into agriculture across Africa, including building its own banks and microfinance institutions which currently operate in seven countries with plans to expand to a total of 12 countries. Initially OI granted loans through its own bank but has now expanded into non-owned institutions to create larger impact on general finance needs across agriculture. In Malawi, smallholder group lending activities and individual loans have been prioritised for a variety of market segments. Recipients include actors in less-structured value chains including groundnuts, soy, sugar, maize seed production, beans, and other food crops.

OI is currently coordinating higher level work on assessing the overall finance market in Malawi and for the region, and finds that by and large the maturity of the financial market is hindered by a lack of segmentation; whereas mature markets offer a broad range of products to fit various demands, The Malawi finance market remains narrow with a limited portfolio of financial instruments.

OI expressed that engaging rural extension service providers and cooperatives to provide last-mile finance for hard-to-reach smallholders remains a key priority. OI also emphasises the need to provide access to risk reduction mechanisms, particularly for rural users. Increasing the internal operating capacity of financial institutions (FIs) was also mentioned as a potential strategy.

7.1.2 One Acre Fund

OAF is an agricultural financier that has championed the approach of providing access to seed and high-quality inputs in addition to traditional cash injections. The organisation hypothesises that the two most important inputs of its model are the actual credit, and fertiliser. OAF has centralised funding with which they provide agricultural credit rather than working through FIs.

OAF has been undergoing the process of digitising its services and integrating mobile money but communicated that several gaps in provision exist; transaction fees, lack of rural access to

mobile money agents, and general infrastructural disadvantages are some of the challenges.

OAF expressed need for alternative financing to support its guaranteed-buying schemes with smallholders, indicating that its ongoing efforts to provide financing for inputs and credit have the potential to become more salient and to impact farmers' incentives when combined with reliable markets and the guarantee of purchase.

7.1.3 Agricultural Commodity Exchange

ACE comprises four entities: the ACE Trust, a development component with the mandate of building capacity for farmers, facilitating trade in rural areas, and improving the livelihoods of smallholder farmers; ACE Africa, the first non-tobacco certified commercial exchange in Malawi which includes a clearing house, warehouse, and all necessary components for the export of agricultural products; Commodity Services Limited (CSL) which acts as ACE's risk-mitigation arm by using ACE's warehouse to store collateral for banks, providing another level of security and facilitating banks to provide finance to processors when their collateral is stored with ACE; and Chithumba, ACE's innovative financing model partnered with the National Bank of Malawi and the Malawi Innovation Challenge Fund (MICF).[465]

The essence of the agricultural commodity change is twofold: firstly to provide a fee-based, secure storage facility producers can utilise to store their agricultural outputs at harvest and delay marketing the goods until the lean season when higher prices can be achieved, and secondly to provide finance and credit to smallholders by acting as an intermediary between banks, who assume lower risk by lending finance to the commodity exchange than by lending directly to smallholders themselves. This function of ACE as a commodity exchange, whereby banks are able to offload some of their risk to the exchange, aligns well with FMT's guiding principles and objective to provide liquidity and access to finance for primary producers in the three selected value chains.

Soya is very well incorporated into ACE's warehouse receipt system given large demand coupled with a production lag. In consultations, ACE indicated that it has been hesitant to intensify the quantity of groundnuts it accepts into its warehouse receipt system due to constraints in testing for aflatoxins, but noted that it would be keen to expand its presence in the groundnut value chain if improved aflatoxin mitigation measures were made available. ACE is particularly invested in facilitating value chain actors' access to insurance, risk mitigation, and creditworthiness to FIs. ACE has formed strong relationships with FIs and insurance actors through the establishment of its warehouse system and its assessments of the physical, financial, and trade risks associated with the production of key agricultural commodities.

7.1.4 Alliance for a Green Revolution in Africa

AGRA focuses on supporting governments to develop conducive policy environments for the private sector in Malawi and several other countries. AGRA is committed to strengthening agricultural systems including access to finance, seed systems, extension systems, and market linkages. Rather than having a direct ground presence to support farmers, AGRA provides catalytic grants to smallholders and partnerships as a central part of its strategy. AGRA has identified FIs' lack of agricultural-specific internal units as a key challenge, as banks have little understanding of how the seasonal agriculture sector operates. AGRA has recently worked on non-capital injection approaches, such as supporting agrodealer hubs with capacity building and working with input suppliers. At present, one of AGRA's major activities is supporting farmer organisations and cooperatives.

7.1.5 National Smallholder Farmers' Association of Malawi

NASFAM works across all of the three value chains selected for Malawi (groundnut, soya, and rice) and provides interventions mobilising farmers for production and ultimately marketing outputs. NASFAM has its own extension network across the country, as well as a pool of lead

farmers who coordinate efforts and provide advising. NASFAM offers tailored advisories in all areas of the value chain, including access to finance, production, post-harvest handling, and marketing. NASFAM works with farmers who are interested in progressing from subsistence farming to accessing markets and provides these farmers with ample information to make practical decisions about what crops to cultivate and how to engage markets.

NASFAM also adds value for groundnut and rice, buying agricultural outputs from its member farmers then processing and marketing food goods under its commercial brand. NASFAM relies on borrowed finance from banks and FIs to buy commodities from member farmers at good prices, and the volume of commodities it can purchase in a given season is reliant on the volume and terms of finance it accesses. Thus, its marketing component could be expanded if provided access to non-traditional financing from a partner such as FMT or facilitated by FMT.

For soya, it acts as a market facilitator promoting linkages and collective action between farmers and potential buyers, engaging in negotiations with big buyers on behalf of its members.

In addition to these key organisations that would provide promising anchor partnerships for FMT in Malawi, additional stakeholders were consulted to determine their current linkages, perceptions of the greatest needs of their beneficiaries, and areas for synergies with FMT. These included current and former staff and consultants who had worked on a variety of projects including: FARMSE, MOST, PROSPER, BIF, MICF. A complete list of stakeholders consulted is presented in the Key Informants Interviewed section.

7.2 Potential Interventions for FinMark Trust

7.2.1 Provide Technical Advisory Services to the ACE Taskforce

ACE is currently in the process of designing a Structured Trade Taskforce Team with the mandate of designing and implementing structured trade finance solutions with financial institutions and industry to support inter-regional and global trade flows. ACE envisions this taskforce working closely with financial institutions to facilitate improved liquidity. The taskforce's potential scope of work includes:

- Design and implement structured trade finance solutions with financial institutions and industry to support inter-regional and global trade flows;
- Design and promote largescale agricultural trade and finance enabling investments to promote structured trade and regional integration;
- Design and implement risk mitigation and management tools for regional agricultural trade and financing;
- Design and implement price risk management tools for regional agricultural trade and financing;
- Promote good agricultural trade policies; and
- Work closely with the Regulator of Exchanges to ensure a quality regulatory regime and a sound and enabling framework for warehouse receipts.

These activities ultimately centre around developing greater liquidity for the marketplace and the agricultural trade environment. ACE expects that this taskforce will become the industry enablers

for specific tasks that lead to liquidity growth, delivering both practical solutions and ensuring their implementation through pilot trades.

In order to realise the potential of such a taskforce, ACE requests technical advisory services (TA) support and external consultants to operationalise the plan, including developing Terms of

Reference (ToRs) for the task force, conducting market consultation and securing support for the taskforce's key tasks, clearly identifying deliverables that will encompass implementation examples, developing a detailed workplan, and determining the exact costs and time needs to create meaningful change.

ACE asserts that supporting the taskforce will catalyse the development of the sector and set into action processes that will continue that development autonomously. While ACE intends to remain a key contributor to this taskforce, it envisions the taskforce as a vehicle through with the broader sector has an opportunity to drive change and improve liquidity.

ACE's proposed taskforce focuses on the marketing of key goods, including soya. Given that Malawi's domestic market remains small, the taskforce will facilitate international exports, particularly to markets within the SADC region. As such, involvement with the taskforce would provide a unique opportunity to create new avenues for sustainable trade and facilitate intercountry market linkages amongst SADC countries.

With its extensive experience in facilitating markets and trade, FMT would be an excellent partner to provide TA and financing for this taskforce. Along with ACE and other private sector contributors to the taskforce, FMT would have the opportunity to influence regional trade and market access across several value chains, with soya being one of the key value chains to be addressed by the taskforce.

7.2.2 Facilitate Provision of Mobile & ICT Extension and Market Data Services

Literature and anecdotal accounts widely confirm the importance of extension workers in improving production, processing and marketing of crops. However, various stakeholders have expressed the challenges traditional methods of extension service provision face, from high costs to limited infrastructure.

Similarly, lack of available data on pricing and markets has adverse effects on the selected value chains, particularly because in rain-fed agriculture most decisions about what crops and quantities to grow are made prior to the start of the growing season and based on unverified data on pricing and markets.

To overcome the challenges associated with reaching rural farmers with production and market data, private sector partners have expressed their intentions to further explore digital delivery of these services. While radio has been considered one of the more technologically advanced means of agricultural information delivery, SMS and smartphone-based apps offer great potential. Information that could be delivered over mobile technology includes:

- Accurate and up to date farm-gate prices for soya, rice, and groundnut[466];
- Information on which agrodealers are providing quality and affordable inputs, what financing options are available for smallholders to access inputs, as well as their rates and how to access them;
- Good agricultural practices for improved yield volume and quantity, including best practices for the handling and storage of susceptible crops such as groundnut;
- Information on climate conditions with district focused advice on inputs, planting and harvesting timings;
- Warehouse receipt options and availability;
- Access to mid-season catastrophe loans in the event of unpredictable financial needs resulting from pests, drought;
- And other relevant information currently disseminated by word of mouth and difficult to push to the most rural of smallholders.

Mobile and ICT extension and market data services will require a combination of increased mobile phone penetration, TA, financing for the development of materials, and education/ campaigns to encourage uptake of newly available extension technologies. FinMark Trust enters at a time where it could be effective in influencing any combination of these needs.

NASFAM offers one potential anchor partner for this work, given their existing network of both member farmers and extension workers. One Acre Fund is also promising as it has already established contact and trust with farmers who receive input packages and ICT extension services could offer a strong complement to these inputs.

If any mobile solutions are of interest to move forward with, mobile corporations will also be crucial partners. In Malawi, mobile money providers like Airtel Money and TNM have introduced services that supply phone-based agricultural information as well as offering collateral-free loan products accessible from almost anywhere. TNM are also currently exploring the roll-out of debit card schemes attached to their mobile money service. This is a specific strategy for targeting opportunities with the rural poor. TNM recognises the importance of small holder farmers owning a bank account, and seeks to make this service more inclusive and broaden their access to finance. Such innovative products and service offers have the potential to accelerate financial inclusion for producers in the soybean, groundnut, and rice sectors.[467]

7.2.3 Provide TA and Financing to Build Insurance Solution

Financial service provision is hindered by a perceived level of risk the agricultural sector carries. FMT could, in partnership with OI and through association with established insurance companies, develop an insurance package to cover farm and non-farm rural risks. With the recent advent of the COVID pandemic, there is an added need for enhanced social protection system for small holder farmers This could be structured under shock a responsive system that could provide, as part of the access to fiancé strategy, an insurance enabled safety net that decreases the risk of micro finance as well as the farmers. "From a social protection perspective, agricultural insurance has the potential to generate a wide range of benefits for poor small-scale farmers – and other vulnerable agricultural value chain actors – in developing and emerging contexts. An agricultural insurance scheme can act as a fundamental shock-responsive component within a broader social protection system, providing low-income farming households with an essential (and timely[468]) layer of protection against natural hazards (such as droughts, floods, pests and diseases), while acting in synergy with traditional social protection measures that focus on chronic vulnerabilities (for example conditional or unconditional cash transfers, as well as capacity building to enable alternative employment opportunities)"[469].

This insurance would cover climate risks, seed germination failure, funeral insurance to cover the death of key small holder farmers[470], price fluctuations caused by market failures, etc. Insurers face considerable difficulties in accessing accurate information when trying to design insurance products for agricultural sector, especially where SHFs are concerned, given the complexity of the various value chains and the diversity that exists across value chains which increases transaction costs The insurance package would need to be designed to build the resilience of smallholder farmers by protecting their working capital and hopefully encourage innovation that will unlock further opportunities to increase productivity, quality and profitability. This increased profitability will take the sting out of paying the insurance premiums. Insured crops would increase the opportunity for accessing finance as it reduces the lending risk of FIs. FMT may have to provide either, a form of underwriting guarantees initially to the Insurance companies, or felicitate a programme in partnership with financial development organisations to reduce the risk of attracting the insurance companies into this market. This initiative can be strengthened by linking it to the program to create credit profiles for new farmers or, strengthen the ability of farmers to access finance in more established programmes. I.e. by working with either ACE or OI the insurance companies FMT could facilitate

the creation of a broadened offer of complimentary financial services to decrease the risk of all stakeholders in the financial inclusion within the value chains.

Given the difficulties that insurance companies face in the cost of assessing crop losses, especially with SHFs they would need to work with all actors within the value chains and utilise their infrastructures to reduce the costs of this insurance. Low awareness and knowledge of insurance — coupled with the high cost of premiums — have restricted farmer uptake. Insurance providers have largely overlooked smallholder farmers; the cost of acquiring and serving rural customers in remote locations makes farmers a less profitable customer segment for the industry. It is recommended that a detailed study be undertaken in Malawi in conjunction with a review of successful models in other regional and African countries (FMT could enhance this process by partnering with either ACE or OI, or both, in this study). Further investigation into agriculturally based index insurance, which leads to pay-outs based on a predetermined indices rather than on-farm visits, should be explored for its potential in Malawi in this more detailed deep dive study. It includes overcoming some of the high operational costs, the cost of premiums and the ease of settling claims. The emergence of mobile and satellite technology has enabled index insurance services to use mobile and satellite technology to digitise service creation and delivery enhancing the penetration of the rural markets and allowing the insurance companies to scale their business models. This intervention could be incorporated into the credit reference profiling, as mentioned above, by partnering with Malawi's mobile network operators to use their mobile technology to register and locate farmers, as well as to use their mobile money platforms to collect premiums and pay out claims. An insurance based model of intervention would be enhanced by further investigation into the reinsurance market for the insurance companies. FMT may be able to provided TA services to the reinsurance companies on a regional bases including the four target countries of Botswana, eSwatini, Lesotho and Malawi. If indexed based insurance can be underwritten offshore, it would decrease the risk of local insurance companies providing products to the SME and SHF's programmes within the agricultural sector. A downstream positive aspect of a growth in these insurance products is it mitigate against the provision of ex post disaster relief funding from both government and aid agencies.

OI is well suited to act as the anchor partner/primary implementer of a well-developed insurance solution, given their existing links to ACE, AGRA, financial intuitions and other primary actors.

Libertas General Insurance Company (previously Liberty General Insurance) could be a potential partner as they have a key strategic output of expanding into the agricultural SME and NGO sectors. Part of an FMT intervention would require the provision of technical support to the insurance company/companies and the underwriters to capacitate them to better understand complexities and risks of these markets. As with provision of finance by the banking sectors, the insurance companies would require specialised in-house technical units for agricultural insurance. The establishment of such units may provide another avenue for FMT's technical support.

"In short, agricultural insurance should be viewed as a critical tool that governments, development agencies and other public and private stakeholders can use to pursue and complement objectives related to social protection for small-scale and vulnerable farmers, especially in the frame of climate change and increasing disaster risk"[471] FMT in conjunction with its current initiatives in Malawi could undertake to work with government and the development community, through the provision of TA from FMT and TA and funding from development partners, to create awareness and policies that government can utilise to improve the enabling environment for insurance.

7.2.4 Finance Credit Reference Profiles

Given that financial service provision is also hindered by a lack of credit history and information on farmers, several private sector actors have expressed that digitalising credit profiles for smallholders and other value chain actors who seek credit from FIs would be beneficial.

Digital farmer profiles piloted by Opportunity International in Uganda were effective in reducing loan approval times from 60 days, to just 4 days. In terms of interventions which require little lead time and can work off of previous learning, financing and providing TA on the scale-up of digital farmer credit profiles provides a viable intervention option for FinMark Trust. AGRA has also underscored the importance of creating credit profiles for credit savings groups and village savings and loan associations (VSLAs), as these groups already exist but their ability to access credit requires attention. Given that VSLAs are a strong tool for incorporating women and youth, this approach would encourage gender and age inclusivity.

Such an intervention would require technical assistance and funds committed towards partnerships with FIs, including an informational campaign to make FIs aware of the digital farmer profiles and encourage them to incorporate these profiles into their risk analyses of credit seekers. Building the technology and encouraging uptake for farmers/credit seekers are also areas where FMT would be well positioned to provide financing and TA. FMT's success in creating an alternative credit scoring mechanism through its partnership with JP Morgan and FinFind, which allows funders to assess value chain actors' credit worthiness with less data than typical models, would be highly useful in Malawi where credit data remains a barrier to access. Combined with credit profiles, FMT would facilitate improvements on both the borrower and lender side and address the asymmetry of information that exists between the two.

7.2.5 Establish a Fund for Catalytic Matching Funding

The private sector partners discussed herein, including OAF, OI, and ACE, maintain a keen understanding of the landscape and needs in Malawi. While innovative programmes enacted by these partners are relatively low risk, they often require cash flows in excess of what is available, particularly when organisations' cash levels ebb and flow around growing seasons. FinMark Trust would be well positioned to create a pool of matching funds for catalytic innovations to buy the risk from these private sector organisations. Matching grant funds and TA would assist in reducing this risk and encouraging innovation.

As a relevant example, One Acre Fund might in the near future have the opportunity to expand its input package in Malawi to include Aflasafe, the unique bioagent that prevents the spread of aflatoxins. As noted, aflatoxins present the greatest challenge to unlocking groundnut's value and quality potentials, and the application of Aflasafe may play an instrumental role in accessing higher value markets. The acquisition and piloting of Aflasafe in Malawi will require funding, which FMT could provide in combination with TA and other potential partners on the testing and rollout of Aflasafe. A report on the commercial scaling of Aflasafe in other countries notes several finance-dependent stages of scaling including product registration (requiring intensive and potentially costly laboratory and field testing), licensing and distribution, establishment of the hardware (factory) to produce suitable quantities, and finally commercialisation.[472] These steps provide various areas where a partner such as One Acre Fund would benefit greatly from match funding provided by FMT to catalyse the roll out of this very promising tool.

Similarly, ACE currently remains hesitant to accept large quantities of groundnuts into its warehouse receipt financing program because one bag of aflatoxin-contaminated oilseeds can quickly spread through a warehouse of groundnuts. At present, ACE tests for mould and moisture but does not have access to aflatoxin testing. If FMT facilitate ACE acquiring aflatoxin testing capabilities, groundnut farmers' access to warehouse receipt financing could increase greatly. ACE would be able to achieve this aim and explore innovative processes for aflatoxin testing with matching funds.

7.2.6 Finance Guaranteed-Purchasing as Part of Bundled Interventions

At present, Opportunity International has a relatively small-scale guaranteed buying scheme through which it buys rice and other commodities from cooperations of supported farmers. Opportunity International has expressed interest in FinMark Trust providing financing to expand its guaranteed buying schemes in Malawi. When coupled with production-side interventions, a guaranteed market can be highly effective in incentivising farmers to grow high quality and safe crops such as oilseeds and rice.

NASFAM also operates a similar scheme whereby it accesses finance to purchase commodities (rice and groundnut, of the selected value chains) from member farmers, adds value, and markets food goods in major retailers under its brand name. NASFAM has also communicated that low-interest financing from a partner or facilitated by such a partner as FMT would unlock great potential for NASFAM and its farmers.

Providing finance for guaranteed purchasing through either of these private sector partners would offer an excellent market-side intervention to build on primary production and access to finance for smallholders. In the case of groundnut, guaranteed purchasing would give OI, NASFAM and FMT both the leverage to require higher standards and lower aflatoxin groundnut outputs from farmers, and the opportunity to facilitate their abilities to produce such groundnuts when coupled with the other interventions proposed herein, such as ICT extension services and/or insurance.

7.2.7 Advocate for Financial Policy Change

FinMark Trust has a proven track record in advocating or lobbying for policy development and is well situated to advocate for financial policies to address the production, marketing, and export of certain crops in Malawi. Opportunities for policy advancement have been identified for the groundnut value chain. This intervention could be linked to or incorporated with ACE's Structured Trade Taskforce Team.

Edelman and Aberman (2015) recommend creating an additional tax incentive for exporters who export safe groundnuts to challenging high value markets (such as the EU or South Africa where aflatoxin testing is intense). Currently, groundnut exporters are entitled to a 25% tax credit. This credit could either be augmented for those who test groundnuts in an ISO-certified facility, or reduced for exporters who fail to meet this standard. Such an intervention would likely have indirect positive impacts on other parts of the value chain and informal markets, too, as the initiative would signify that Malawi intends to uphold and improve its reputation as a key regional groundnut exporter.

Success of such an intervention would, of course, rely on cooperation from the Government of Malawi and its relevant authorities in agriculture and finance. Should taxation policy be adjusted, FMT could also play a crucial role in dissenting information about the redefined incentives to value chain actors, facilitating improvements to current agricultural and storage practices to meet new standards, and facilitating communications with international markets that may have renewed interest in Malawi's groundnuts upon learning of refreshed safety precautions.

7.2.8 Strengthen Value Chain Actors' Capacity to Access Traditional Loans

While loans catering to the needs of rice, soya, and groundnut value chain actors are limited, some do exist through traditional FIs. In addition to efforts to create new avenues for financing, FMT could work through existing channels on the credit-borrower side to improve traders, aggregators, and processors' abilities to access credit.

It is known that low technical and managerial skills prevent SMEs and smallholders from accessing credit; insufficient tracking of cash flows, lack of audited financial statements, lack of

ability to write comprehensive bankable business plans and lack of collateral are leading factors preventing farmers from accessing bank loans. This lack of access is antithetical to FinMark Trust's core value of "making financial markets work for the poor, by promoting financial inclusion and regional financial integration."[473]

FinMark Trust might contribute to the financial literacy and knowledge of downstream actors by leveraging its broad financial expertise to create capacity building content. For example, rice traders' access to loans through conventional financial institutions would be greatly improved if traders could present cash flow and revenue/asset registers using Excel or similar technology. FinMark Trust could provide training materials or templates for creating these financial documents, which farmers, middlemen, traders and/or mills could present directly to banks when securing working capital loans. FMT might accomplish this through extension workers or perhaps even through partnerships with banks or other financial institutions in Malawi.

If approached sensitively, such a partnership could be mutually beneficial to both the financial institution (which would increase its revenue stream from providing higher numbers of fair loans to more farmers with better documentation, without exorbitantly high interest rates) and the borrowers.

Similarly, FinMark Trust could create a program to audit financial statements and asset registers for farmers/SMEs looking to gain access to capital, either directly or through partnership with a financial institution or financial inclusion focused NGO). This could be part of credit reference profiling intervention. This approach offers a direct solution to the barrier of insufficient documentation and competent bankable business plans to obtain loans from Malawi's banks and MFIs under the logic that better financial documentation leads to higher rates of approval for more affordable capital loans. In order to do so, FinMark Trust would need to gain access to value chain actors directly and would need to create reliable relationships with lending banks as well to understand their specific requirements for borrowers and how FMT could support borrowers in meeting those documentation requirements.

FMT appears to have existing programs already employing this approach; its MSME program includes the objective of "improving entrepreneurship and business skills", which is exactly what is needed for rice value chain actors to access financial credit in Malawi. This intervention would be particularly salient if bundled with one or several other interventions, especially the provision of accessible loans.

Notes from sections

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6 Economic Commission for Africa (2017). Country Profile: Malawi.
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8. MALAWI APPENDICES

8.1. Appendix A - Value chain selection longlist

Commodity/VC	Justification
Groundnut	• One of the strategic crops in the National Export Strategy (NES) and also MGDSII • Majority of farmers in Malawi, including women, have long history and experience in groundnut production • Grown for both food and income generation • Used to be leading exporter in Africa but lost share of world market due to high incidence of aflatoxin • Malawi has the natural endowment but unable to meet domestic and regional demand as well as regain its foothold in the global market
Macadamia	• Global consumption of macadamia is projected to increase • Large tracts of land suitable for macadamia production particularly in the central and norther regions of Malawi – strong potential for intercropping • With restricted expansion of estate sector, opportunities for expansion to come from smallholder production – strong private sector and cooperative buy-In • High-value and strong reputation for good quality
Paprika + chillies	• Large scope for growth in volumes and aggregation, within short time scales • Paprika can be intercropped with maize and macadamia and as a cash substitute for tobacco – grown under similar conditions as tobacco – prospects for tobacco diversification • Lucrative prices for smallholders
Beef/livestock	• Malawi is home to 1.5 million cattle, and smallholders supply 90 percent of the beef in the country. • Strong opportunities to grow the livestock sector • Opportunities for value addition - The most significant opportunities are in cattle farming for meat products and milk production as well as other dairy produce such as cheese and yoghurt.
Rice	• Rice is a staple crop of Malawi grown in several regions – high demand both nationally and internationally • Kilombero rice is rain-fed and grown solely by small-scale farmers. It is a long-grain rice considered the highest quality in Malawi. In some international markets it is considered a substitute to Basmati at a much lower price.
Spices (ginger/ garlic)	• strong demand on the local market and high demand on the global market • Scope for development in volumes and aggregation, within short time scales • Various opportunities for value addition • Additionally for most smallholders crops potentially very attractive, and easy to transfer skills and inputs.
Aquaculture	• Important sector in Malawi, because it is potentially the main driver of sustained fish supply to the nation to match the increasing protein needs of the population to compensate for the dwindling fish catches under capture fisheries. • Combined with capture fisheries, fish supply to the domestic market still falls short of domestic demand. • VC actors face challenges in accessing commercial finance investment to expand operations

Industrial hemp/cannabis	• Potential to replace tobacco as Malawi's major cash crop • Thrives in dry conditions – good fit for Malawi's climate • Can be processed into various products – construction materials, cosmetics, food • Economic, medical, and nutritional value
Soybean	• Crop is well adapted for production in all agro-ecological zones in Malawi • Smallholder farmers are the primary growers of soybeans and account for 91% of total soybeans production in Malawi • High demand for soybean due to expansion of the poultry and fish industry in Malawi • Private sector interest, especially processors to support and enhance soybean production to meet local demand
Coffee	• Many varieties are grown in Malawi depending on climate, topography and availability of seed, however the Geisha variety has excellent characteristics for Malawi, including disease resistance, and provides excellent cup quality. • Improvements in basic drying and processing techniques could yield strong improvements – giving potential for development of speciality coffees

8.2. Appendix B – Malawi value chain scoring matrix

8.2.1. Cannabis and hemp

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Cannabis/hemp		Evidence to support scoring
1	CATEGORY	MARKET DEMAND & COMPETITIVENESS	15%	Score	Weighted score	Justification
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	1	0,1	No local demand or even local demand catered for in Malawi Regulations. Hemp is a temperate crop with no known varieties suitable for tropical environments; while breeding can be done, it would take upwards of three years to have a cultivar that can withstand tropical Malawi and still come in under the regulation THC threshold of 0.2%
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	0	0	Definitly not, as highly regulated and expensive security infrastructure and current cultivar pool not acceptable in tropical environments.
2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification

a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	1	0,1	Currently no existing capacity to process hemp for fibre or seed in Malawi. This could change, but again, dependent on having tropical cultivars that meet regulation. Processing equipment for CBD is non-existent but easily capacitated. The costs are formidable for CO_2 equipment and would not be targeted for acquistion by typical farmers. Ethanol extraction equipment is more affordable and scaleable, but the cost of ethanol is a limiting factor (In Zimbabwe, ethanol is processsed on a massive scale from sugarcane for the fuel additive market and so ethanol can be diverted into the extraction market competitively (USD1/ litre), Malawi does not have such an industry, at least not on the scale of Zimbabwe.
3	**CATEGORY**	**INCOME, EMPLOYMENT & INCLUSION**	**20%**	**Score**	**Weighted score**	**Justification**
a	economic	"Size of contribution to gross value of agricultural output"	5%	0	0	New industry, not yet started. Projection wise, very tentative.
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	0	0	Current is nil. Prospective; speculative. Current regulations stringent and the cost for security and meeting regulations prohibative. Jobs will only be created if a windfall on production and market access (which has not manifested internationally), and is tied to tropical cultivars developed.
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	0	0	Too high barriers to entry without reform of current regulation and development of tropical cultivars of hemp.
4	**CATEGORY**	**"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"**	**10%**	**Score**	**Weighted score**	**Justification**
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	3	0,12	Mono-crop and not grown indoors if profit maximisation is key (and outside medicinal use, even though medicinal can be grown outdoor as well under GcAP). Mostly grown organically, although industruial use for fibre may not necessitate organic. Processing and production EIA accounted for in regulations and all GcAP and GMP accredidation, which is necessary at this stage. Slated as an export crop, using air transport as its mode of trade transport, it rates lower on environmental footprint.

b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	3	0,12	Hemp is fairly drought tolerant, irrrigated, using +/-1 litre per M sq. per day. Not bred specifically for drought tolerance, soil salinity or flooding and will be susceptible to flooding and salinity, but a faily resilient plant.
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	3	0,06	As a drug plant, susceptible to fungus and as a heavy feeder, to heavy metals in soil, it could affect consumers, thus it is highly tested, as called for under regulations. As a food crop (hemp seed) could also be under similar risk. As a fibre plant, none.
5	**CATEGORY**	**FOOD SECURITY & NUTRITION***	**10%**	**Score**	**Weighted score**	**Justification**
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	0	0	While having positive medicinal effects, this is not catered for in both the regulation and the criteria presented here.
b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	0	0	Hemp seed is high in healthy fats and amino acids, good non-meat protein source, high in Vitamin E, phosphorous, potassium, magnesium, calcium, iron and zinc. Saying that, there are no current regulations in Malawi for domestic medicinal or health use. This may change, but unlikely in te near future.
6	**CATEGORY**	**NATIONAL PRIORITY & SUSTAINABILITY**	**20%**	**Score**	**Weighted score**	**Justification**
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	0	0	Untouchable by traditional donor ethics.
b	Institutional	Coherence with National Policies	10%	1	0,1	Perhaps part of national agriculture commercialisation, but I have not seen the National Stategic Plans for Malawi agriculture. Coherence would mean that the investment and market potential is large, which, currently, it is not.
7	**CATEGORY**	**ACCESS TO FINANCE/ ADDITIONALITY (for FMT)**	**15%**	**Score**	**Weighted score**	**Justification**
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	5	0,5	New industry, and due to Covid 19, has not been able to get off the ground in any meaningful way. Investment is waning in cannabis, especially in speculative geographic environments.

b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	3	0,15	Perhaps, but will need substantial changes to both regulation (lowering barriers to entry) and, more importantly, proof of concept with current regulations, which will undoubtedly fail as Hemp is not a tropical crop.
TOTAL (max score = 5 points)			**100%**		**1,25**	
					28%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

8.2.2. Coffee

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Coffee		Evidence to support scoring
1	CATEGORY	MARKET DEMAND & COMPETITIVENESS	15%	Score	Weighted score	Justification
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	4	0,4	Market from a traditional perspective has been >90% for export. Malawi reputationally has good quality potential and resultantly has a high demand for good quality coffee. Demand far exceeds supply for Malawi coffee on the export market. Locally there has been a growth in domestic consumption which has increased local demand in recent years.
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	3	0,15	Malawi still has relatively low costs of production in comparison to competing producing nations. Traditionally, knowledge and experience in growing coffee was well developed. Recently however, limitations have arisen due to Malawi's monomodal rainfall pattern and increasing pressures on the crop due to climate change. The over-reliance on the NYC has also greatly impacted on coffee development with the recent collapse in world prices.
2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification

a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	3	0,3	There is potential, mainly for up-stream value addition in terms of scaling up to roasting. However, logistically Malawi suffers due to its landlocked geographical location. Transportation of roasted coffee is limited due to cost to rail, road and ship. Airfreight is poorly developed and exorbitant and therefore not a feaisble option on transport.
3	CATEGORY	INCOME, EMPLOYMENT & INCLUSION	20%	Score	Weighted score	Justification
a	economic	"Size of contribution to gross value of agricultural output "	5%	3	0,15	There is great potential in areas that are suitable for growing coffee in Malawi, that is with the correct altitude and annual precipitation, and with an integrated model that includes crop diversification and shade.
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	2	0	Coffee is a long-term crop that requires a relatively high level of skill and input, unless there is a structured support system and mechanism in place such as a cooperative or anchor estate, adoption will remain low.
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	4	0,2	The potential for inclusion of women and youth is relatively high. The crop is seen as a family crop and often all members of the family are included in its production.
4	CATEGORY	"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"	10%	Score	Weighted score	Justification
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	4	0,16	The coffee plant is potentially a tree crop and as such promotes afforestation. If grown responsibly the negative environmental impact is negligible.
b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	2	0,08	Arabica coffee is hugely reliant on water to ensure sustainable production. As a result, climate change in terms of drought and increases in temperatures can have an adverse effect on production.
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	4	0,08	The risk of aflatoxin in coffee is much lower than other crops. Adherence to the correct drying methods and controls and checks on moisture content can easily prevent any health and safety issues.

5	CATEGORY	FOOD SECURITY & NUTRITION*	10%	Score	Weighted score	Justification
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	1	0,05	In Malawi it is highly unlikely that coffee produced on a smallholder farm is consumed in the home. It is not a traditional staple crop and therefore has no value in terms of nutrition in terms of HH food security.
b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	1	0,05	In Malawi it is highly unlikely that coffee produced on a smallholder farm is consumed in the home. It is not a traditional staple crop and therefore has no value in terms of nutrition in terms of HH food security.
6	CATEGORY	NATIONAL PRIORITY & SUSTAINABILITY	20%	Score	Weighted score	Justification
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	3	0,3	Coffee has in the past and more recently been the beneficiary of a number of donor projects.
b	Institutional	Coherence with National Policies	10%	1	0,1	Coffee was one of Malawi's primary crops and has a long-standing tradition of production in Malawi. However, it has not been seen as a strategic crop for some time and as a result there is very little government intervention on the crop.
7	CATEGORY	ACCESS TO FINANCE/ ADDITIONALITY (for FMT)	15%	Score	Weighted score	Justification
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	2	0,2	Predominantly the coffee sector in Malawi was split into two. The estate grown production and small-holder production. Estate production was privately driven and financed. The small-holder production has received government support - originally as a smallholder project and then latterly through donor funding.
b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	2	0,1	On the small-holder side access to finance is difficult due to poor past records and a lack of financial independence. From a estate sector side finance can be leveraged on the back of buyer contracts.
TOTAL (max score = 5 points)			**100%**		**2,32**	
					46%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

8.2.3. Aquaculture

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Aquaculture		Evidence to support scoring
1	CATEGORY	MARKET DEMAND & COMPETITIVENESS	15%	Score	Weighted score	Justification
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	4	0,4	Fish represents the first choice of animal protein for the majority households in Malawi. Demand for fresh tiapia (the product of aquaculture) is said to outstrip supply in all areas, with market studies indicating a market demand of >25,000 T/annum locally in 2020, growing to >30,000 T/annum by 2030 - accounting for population growth and increased household income in urban areas. The demand for fish, especially tilapia, is growing with largely informal imports from neighboring countries.
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	3	0,15	Commercial producers are in a very strong position (e.g. commercial cage producers: Maldeco - the only truly commercial farm; LM Aquaculture Limited - an emerging venture, and larger smallholder producers) to monopolise market share (approx 25,000 T/annum for larger-sized fresh, frozen and processed products in urban centres). Smallholder producers are also in a strong position to maintain their market within their locale - typically selling all products fresh at farmgate or at local/regional trading centres)
2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification
a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	3	0,3	Opportunities for developing/improving value addition by commercial actors is very high (e.g. Maldeco and LM Aquaculture Limited) with efforts to install improved cold storage/chain and processing facilities onsite. These will include filleting, crumbed and frozen options for urban supermarkets and other retail (for both domestic and export markets). For smallholders (80% of producers) The need for value addition is less essential as fresh fish forms are by the far the most valuable (MWK/Kg). Scope for smallholder producers to mitigate post-harvest loss by basic processing is high if gross margin feasibility can prove the value in this process.
3	CATEGORY	INCOME, EMPLOYMENT & INCLUSION	20%	Score	Weighted score	Justification

a	economic	"Size of contribution to gross value of agricultural output "	5%	2	0,1	Reports vary - government of Malawi annual reports indicate approx 1-2% for fisheries and aquaculture combined (i.e. aquaculture approx 0.2%), but other sources (e.g. USAID FISH project) highlight greater contribution of the sectors (fisheries and aquaculture combined) to approx 4% of GDP. The importance of aquaculture for the future is tied to increasing demand which cannot hope to be met through sustainable capture fisheries production and a need for income diversification opportunities for small-scale entrepreneurs. This has been seen throughout Africa - most recently Zambia 2018-present.
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	2	0	Aquaculture does not typically offer signficant scope for high employment, though there is potential for greater inclusion moving forward - current studies are assessing current status of employment in the sector, and exploring opportunities for greater inclusion. The majority of employment opportuntities are likely to be on a casual basis and tied to specific production activities (e.g. harvest and for post-harvest sales).
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	3	0,15	As above, in the existing fisheries value chain, gender inclusion is relatively good with approx 60:40 ratio (male:female) and this is matched well by the aquaculture sector. Youth also play a key role in specific production activities and casual labour tasks as part of household labour. Opportunities for greater roles will be tied to increasing productivity of the commercial sector.
4	**CATEGORY**	**"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"**	**10%**	**Score**	**Weighted score**	**Justification**
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	4	0,16	Very low negative impact at current scale and unlikely to become a major issue in future. Commercial activities either employ cage technologies on Lake Malawi - sited in areas with good water circulation, depth and low fishing or recirculating systems that mitigate harmless outflow. Smallholder producers who use earthen ponds typically do so as part of an integrated Agriculture-aquaculture sytem which utilise nutrient rich greenwater (outflow from ponds) to irrigate and fertilise crop fields (extensive evidence demonstrates how this can be beneficial for the ponds - which require emptying on an annual basis, and the fields, which benefit from nutrient addition) which in many instances can actually lead to a net positive for the environment.

b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	3	0,12	The majority of smallholder producers rely on rainfed systems and are therefore highly dependent on reliable rainfall (Dec-Apr) to allow production cycles to run optimally. These producers are suseptible to drought and flooding alike. However, many larger producers (i.e. both smallholder and larger-scale commercial operators) are fortunate to leverage either springs, streams/rivers or lakes for their water supply and are therefore less affected.
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	2	0,04	Providing fish is sold fresh, processed correctly or the coldchain is maintained the risks are low. This is typically less of a risk for aquaculture when compared with fisheries.
5	**CATEGORY**	**FOOD SECURITY & NUTRITION***	**10%**	**Score**	**Weighted score**	**Justification**
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	4	0,2	Fish contributes >60% of animal protein and approx 40% total protein consumption in Malawi. The evidence is well-documented regarding the nutrional benefits of fish for not only healthy living, but also mother and child development (throughout gestation), early years, low saturated fat etc.
b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	4	0,2	"Per capita tilapia consumption was 8.12 kg per year in 2014 and is projected to reach 10 kg by 2020 according to Malawian Government. Fish is an important source of proteins, calcium, iron, iodine and potassium to many households in Malawi."
6	**CATEGORY**	**NATIONAL PRIORITY & SUSTAINABILITY**	**20%**	**Score**	**Weighted score**	**Justification**
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	3	0,3	Currently, GIZ are supporting through multiple programmes - Aquaculture Value Chain Project (AVCP 2018-2022*), Worldfish IBEMs (2019-2021) and Worldfish/Malawi Gov Fingerling supply chain development. DFID are supporting CASA (2018-2021/2), AfDB is supporting Malawi government (2020-) Fisheries and Aquaculture Watershed development project. These existing projects are focused on improving productivity of smallholder producers, or key aspects of the value chain (e.g. fingerling supply, market and distribution) and seem to neglect access to finance as a core focus.
b	Institutional	Coherence with National Policies	10%	4	0,4	"High coherence and of key importance when considering the ongoing demise of capture fisheries and ever-increasing demand for fish by demand market. "

7	CATEGORY	ACCESS TO FINANCE/ ADDITIONALITY (for FMT)	15%	Score	Weighted score	Justification
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	5	0,5	Access to finance and financial inclusion is regularly highlighted as a key barrier for growth at both individual and sectoral level. Commercial finance institutions are highly reluctant to fund aquaculture at this stage compared with alternative commodities that can demonstrate greater proof of concept.
b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	4	0,2	Opportunities for diversifying existing offerings from commercial and MFIs to include aquaculture stakeholders could be exploited to great effect if executed effectively and with a suitable sample of producers in order to act as proof of concept. Scaling would require successful iterations, but the scope for significant benefit throughout the value chain is high (e.g. producer).
TOTAL (max score = 5 points)			**100%**		**3,22**	
					64%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

8.2.4. Macadamia

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Macadamia		Evidence to support scoring
1	CATEGORY	MARKET DEMAND & COMPETITIVENESS	15%	Score	Weighted score	Justification
a	economic	"Market demand prospects (local and/ or export). Consider the current demand but growing demand as well."	10%	5	0,5	International market demand is high due to macadamia being a healthy food.
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	4	0,2	Most commercial macadamia estates / farms in Malawi with the current international market prices have the capacity/potential to produce SK competitively.
2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification
a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	5	0,5	Values addition opportunities exit in the snack and confectionary market internationally. Most factories are entering into contracts with marketing companies who advertise and secure different outlets and markets all over the world. i.e. Green & Gold Macadamia. In order to remain competitive in the next 10-20 years you have to secure these markets as the china crop grows. Compliance, standards and consistency are key.
3	CATEGORY	INCOME, EMPLOYMENT & INCLUSION	20%	Score	Weighted score	Justification
a	economic	"Size of contribution to gross value of agricultural output"	5%	1	0,05	Still relatively low
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	3	0	Opportunities exist but will take long term investment to develop plantations and farms
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	1	0,05	The only positive is that seasonal employment will be offered at certain times of the year but macadamia is a male dominated crop

4	CATEGORY	"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"	10%	Score	Weighted score	Justification
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	3	0,12	Farms are generally environmentally friendly. IPS must be followed with greener chemistry being used.
b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	2	0,08	Macadamia trees are climate sensitive, especially during the flowering phases where certain temperatures, relative humidity and soil moisture levels are required. In the dry season irrigation is required as rainfall becomes more erratic.
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	1	0,02	Healthy nut to eat, no significant risk
5	CATEGORY	FOOD SECURITY & NUTRITION*	10%	Score	Weighted score	Justification
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	1	0,05	Not a staple crop. Macadamia is a luxury item, not a commodity.
b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	4	0,2	Has good nutritional benefits. Studies are under way and data on this can be researched.
6	CATEGORY	NATIONAL PRIORITY & SUSTAINABILITY	20%	Score	Weighted score	Justification
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	1	0,1	Very low. Most macadamia companies are private sector driven.
b	Institutional	Coherence with National Policies	10%	4	0,4	Macadamia is a priority export crop
7	CATEGORY	ACCESS TO FINANCE/ ADDITIONALITY (for FMT)	15%	Score	Weighted score	Justification

a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionally for FMT) (score low for high level of financial inclusion)"	10%	4	0,4	Private companies are self financed.
b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	3	0,15	Possible with international trust funds under the correct conditions and structures.
TOTAL (max score = 5 points)			**100%**		**2,82**	
					56%	
Scores:		" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"				
		* If applicable - disregard category 5 for non-food commodities				

8.2.5. Paprika and chillies

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Paprika + Chillies		Evidence to support scoring
1	CATEGORY	MARKET DEMAND & COMPETITIVENESS	15%	Score	Weighted score	Justification
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	5	0,5	There is good demand for high quality chillies, specifically of Birds Eye from Malawi. Malawi once was a significant producer of both paprika and chillies.
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	4	0,2	Both paprika and chillies grow in similar soils and climates to tobacco and therefore there is great potential to increase chilli / paprika production. It is a relatively easy crop to grow and there is insitutional knowledge on how to grow these crops.
2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification
a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	3	0,3	There is good potential for value addition, but the main limitation is the absence of any cooperative or farmer grouping focused on these crops. There is a large scheme in the north run by a private operation that operates as an anchor estate and that provide seed, agronomical expertise and in return buys the resultant produce.

3	CATEGORY	INCOME, EMPLOYMENT & INCLUSION	20%	Score	Weighted score	Justification
a	economic	"Size of contribution to gross value of agricultural output"	5%	2	0,1	Usually Malawi produces and exports dried chillies or paprika, there is very little value added between vendor and trader to the final product. The price paid is usually higher as a result, although sorting, cleaning and further drying can occur after purchase and prior to export.
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	4	0	The potential to introduce further producers is high. The crop is similar, especially paprika, to tobacco and grows well under similar conditions and climates, therefore the rate of expected adoption is high.
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	4	0,2	There is potential to include disadvantaged groups - however this will require a concerted effort and a new approach.
4	CATEGORY	"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"	10%	Score	Weighted score	Justification
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	4	0,16	The impact of growing this crop on the environment is small to low. The plant grows relatively well and does not require high levels of input in terms of chemistry.
b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	4	0,16	This crop is pretty resilient to climate change, and is relatively drought tolerant.
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	3	0,06	The main area of risk is during drying, provided this is monitored and controlled adequately, the end risk to consumers is low. Simple moisture checks can provide adequate preventative controls.
5	CATEGORY	FOOD SECURITY & NUTRITION*	10%	Score	Weighted score	Justification
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	3	0,15	These crops are generally used as a spice. Small portions may be consumed for local consumption, but as a seasoning for food - rather as a staple.

b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	3	0,15	Paprika and chillies have noted nutritional benefits.
6	**CATEGORY**	**NATIONAL PRIORITY & SUSTAINABILITY**	**20%**	**Score**	**Weighted score**	**Justification**
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	3	0,3	There have been several donor projects on this crop. A large commercial project is currently being undertaken in the north, supporting small producers through the provisiion of land, irrigation, seed and inputs in return for the produce.
b	Institutional	Coherence with National Policies	10%	3	0,3	Chillies and Paprika are not seen as strategic crops by government and therefore there is little regulation or government intervention on these crops.
7	**CATEGORY**	**ACCESS TO FINANCE/ ADDITIONALITY (for FMT)**	**15%**	**Score**	**Weighted score**	**Justification**
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	3	0,3	As mentioned, there have been several donor projects on this crop. A large commercial project is currently being undertaken in the north, supporting small producers as an indirect form of finance.
b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	2	0,1	Traditionally banks and the financial sector have had low or no appetite for financiing the small holder agricultural sector due to high risk and as a result of little or no collateral being available to the farmer.
TOTAL (max score = 5 points)			**100%**		**2,98**	
					60%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

8.2.6. Rice

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Rice		Evidence to support scoring
1	CATEGORY	MARKET DEMAND & COMPETITIVENESS	15%	Score	Weighted score	Justification
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	5	0,5	Current supply falls short of domestic demand. There is also high demand for Malawi rice in neighbouring countries mainly due to the renowned aromatic taste of the Kilombero variety.
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	4	0,2	There are about 75,000 smallholder producers of rice in Malawi. Yields are gradually increasing and the current mean is 1.5 metric tons per hectare.
2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification
a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	3	0,3	There are numerous rice mills in Malawi. One of the largest rice milling plants owned by Mtalimanja Holdings is in Mpamata, Nkhotakota district. The plant is currently underutilised due to inadequate rice for milling.
3	CATEGORY	INCOME, EMPLOYMENT & INCLUSION	20%	Score	Weighted score	Justification
a	economic	"Size of contribution to gross value of agricultural output"	5%	3	0,15	Rice is one of the main crops produced by smallholders in Malawi and makes a significant contribution to the country's GDP.
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	5	0,5	About 75,000 smallholders produce rice in Malawi. There are numerous employment opportunities at the farm level and in upstream activities that include processing, packaging, distribution and retail.
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	4	0,2	Women and youth provide most of the labour in rice production. Several donor funded programmes have contracted women as certified seed growers.
4	CATEGORY	"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"	10%	Score	Weighted score	Justification

a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	3	0,12	Like most crops, rice requires basal and top dressing fertilisers to achieve good yields. Herbicides can also be used to minimise use of labour in weeding.
b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	3	0,12	Rice is a hydrophylic crop and will not do well if there is insufficient rain. When irrigation is available, two crops can be produced in a year.
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	4	0,08	Rice is a healthy food rich in starch, a source of carbohydrates.
5	**CATEGORY**	**FOOD SECURITY & NUTRITION***	**10%**	**Score**	**Weighted score**	**Justification**
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	5	0,25	Rice is one of the main staple foods in Malawi and contributes sgnificantly to household food security.
b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	4	0,2	Rice is one of the main staple foods in Malawi with good calorific value. It's consumed as an alternative to maize, potatoes and cassava to improve dietary diversity.
6	**CATEGORY**	**NATIONAL PRIORITY & SUSTAINABILITY**	**20%**	**Score**	**Weighted score**	**Justification**
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	4	0,4	DFID supported the rice value chain under the Business innovation Facility Project which ended in June 2019. GIZ, the EU, AfDB, the World Bank and many other donors also provide funding to the value chain.
b	Institutional	Coherence with National Policies	10%	4	0,4	The Government of Malawi has prioritised rice as one of the main crops in order to achieve national food security, improve diets and diversify exports.
7	**CATEGORY**	**ACCESS TO FINANCE/ ADDITIONALITY (for FMT)**	**15%**	**Score**	**Weighted score**	**Justification**
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	4	0,4	Smallholder rice produce struggle to access affordable finance to buy inputs and increase yileds and output.

b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	4	0,2	Affordable finance would help to increase use of certified seeds and other inputs and increase yields and output and make Malawi rice more competitive in domestic and export markets.
TOTAL (max score = 5 points)			**100%**		**4,02**	
					80%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

8.2.7. Soya

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Soya		Evidence to support scoring
1	CATEGORY	MARKET DEMAND & COMPETITIVENESS	15%	Score	Weighted score	Justification
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	5	0,5	There is significant demand for soya for value addition in Malawi. The oil is sold as cooking oil. Though the oil imparts a slight flavour which might not be favouable to every palate, recent improvements in processing technology eliminates this odour and flavour to a large extent. The deoilied cake is the main source of protein in animal feed and has significant potential both locally and for exports
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	5	0,25	This is predominately a smallholder crop grown across the country
2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification
a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	4	0,4	significant potential for value addition
3	CATEGORY	INCOME, EMPLOYMENT & INCLUSION	20%	Score	Weighted score	Justification

a	economic	"Size of contribution to gross value of agricultural output "	5%	4	0,2	One of the key oilseeds currently produced in Malawi
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	4	0	Heavily produced thtroughout Malawi, common crop
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	4	0,2	Considered a female crop and employment opportunities along the VC
4	**CATEGORY**	**"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"**	**10%**	**Score**	**Weighted score**	**Justification**
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	3	0,12	No negative impact unlike in argentina where large tracts of forest cover was removed to plant Soya
b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	3	0,12	Legumes are somewhat susceptible to climate change
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	4	0,08	
5	**CATEGORY**	**FOOD SECURITY & NUTRITION***	**10%**	**Score**	**Weighted score**	**Justification**
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	4	0,2	Consumed widely by producing households
b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	4	0,2	Soya meat products are a good source of protein
6	**CATEGORY**	**NATIONAL PRIORITY & SUSTAINABILITY**	**20%**	**Score**	**Weighted score**	**Justification**

a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	5	0,5	Signficant influence of multiple donors in the value chain especially on the agronomy and policy side (MOST was one) but few on finance
b	Institutional	Coherence with National Policies	10%	4	0,4	Linked to multiple policies like NES
7	**CATEGORY**	**ACCESS TO FINANCE/ ADDITIONALITY (for FMT)**	**15%**	**Score**	**Weighted score**	**Justification**
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	3	0,3	Scope for financial inclusion
b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	3	0,15	
TOTAL (max score = 5 points)			**100%**		**3,62**	
					72%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

8.2.8. Spices

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Spices (garlic + ginger)		Evidence to support scoring
1	**CATEGORY**	**MARKET DEMAND & COMPETITIVENESS**	**15%**	**Score**	**Weighted score**	**Justification**
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	4	0,4	Signinficant demand within the region for dried and pulverised ginger and garlic
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	3	0,15	Technical crop hence not meant for the poorest of the poor but progressive farmers who have some capacity to grown and understand crops can be provided with technical backstopping and support to grown a high value crop

2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification
a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	4	0,4	Significant potential for value addition including dried, pulverised and moving on to essential oils which is a niche high value market with export potential
3	CATEGORY	INCOME, EMPLOYMENT & INCLUSION	20%	Score	Weighted score	Justification
a	economic	"Size of contribution to gross value of agricultural output "	5%	1	0,05	Negligble
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	3	0,3	Multiple opportunities but with progressive farmers with some capacity both in terms of technical skills and some financial capacity
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	3	0,15	Yes
4	CATEGORY	"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"	10%	Score	Weighted score	Justification
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	3	0,12	Negligble
b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	3	0,12	susceptible to climate change hence irrigation is helpful
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	4	0,08	No particular risk
5	CATEGORY	FOOD SECURITY & NUTRITION*	10%	Score	Weighted score	Justification
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	1	0,05	No significant contribution to HH food security

b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	1	0,05	No particular nutritional value for rural households
6	**CATEGORY**	**NATIONAL PRIORITY & SUSTAINABILITY**	**20%**	**Score**	**Weighted score**	**Justification**
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	1	0,1	Negligible at present
b	Institutional	Coherence with National Policies	10%	2	0,2	Aligned with NES and value addition
7	**CATEGORY**	**ACCESS TO FINANCE/ ADDITIONALITY (for FMT)**	**15%**	**Score**	**Weighted score**	**Justification**
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	4	0,4	Limited financial inclusion in the sector but opportunities available as this is a high value cash crop that can be grown. Access to reliable markets can be a challenge as most buyers need to be assured of reliable supply.
b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	4	0,2	Opportunities are available as farmers need finance to support irrigation, small scale farm mechanisation, input credit and farm management
TOTAL (max score = 5 points)			**100%**		**2,77**	
					55%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

8.2.9. Groundnuts

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Groundnut		Evidence to support scoring
1	**CATEGORY**	**MARKET DEMAND & COMPETITIVENESS**	**15%**	**Score**	**Weighted score**	**Justification**
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	5	0,5	Intl. demand growing

b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	3	0,15	"Plenty of investment in the supply chain Introduction of new technologies to improve productivity Aflatoxin challenge limits potential"
2	**CATEGORY**	**VALUE-ADDITION**	**10%**	**Score**	**Weighted score**	**Justification**
a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	4	0,4	"Quite high potential. Peanut powder, paste Limited at present but growing with investment"
3	**CATEGORY**	**INCOME, EMPLOYMENT & INCLUSION**	**20%**	**Score**	**Weighted score**	**Justification**
a	economic	"Size of contribution to gross value of agricultural output"	5%	4	0,2	Highly grown crop, regional exports are noteworthy
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	5	0,5	~700,000 SHFs producing GNs ; Other employment created in Groundnuts processing include sorting, cleaning, grading, bagging.
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	5	0,25	Mostly farmed by women
4	**CATEGORY**	**"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"**	**10%**	**Score**	**Weighted score**	**Justification**
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	3	0,12	"Nitrogen fixing but requires chemical inputs Negative impacts of processing - waste at factory level"
b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	3	0,12	Susceptible to climate change
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	2	0,04	"Aflatoxin - high risk Positive impacts of replacing tobacco"

5	CATEGORY	FOOD SECURITY & NUTRITION*	10%	Score	Weighted score	Justification
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	5	0,25	60% of the production eaten locally as processed into flour, which is used as a seasoning for food. Nuts are also boiled or roasted and eaten as a snack.
b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	5	0,25	Groundnuts contains several important nutrients including protein and oils; used in supplements
6	CATEGORY	NATIONAL PRIORITY & SUSTAINABILITY	20%	Score	Weighted score	Justification
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	5	0,5	Many donors investing - well aligned with donor priorities
b	Institutional	Coherence with National Policies	10%	4	0,4	Key priority for gov - national export strategy
7	CATEGORY	ACCESS TO FINANCE/ ADDITIONALITY (for FMT)	15%	Score	Weighted score	Justification
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	3	0,3	Good scope for financial inclusion
b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	3	0,15	
TOTAL (max score = 5 points)			**100%**		**4,13**	
					83%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

8.2.10. Livestock

SELECTED KEY & ADDITIONAL CRITERIA			Weight of criteria of total %	Livestock		Evidence to support scoring
1	CATEGORY	MARKET DEMAND & COMPETITIVENESS	15%	Score	Weighted score	Justification
a	economic	"Market demand prospects (local and/or export). Consider the current demand but growing demand as well. "	10%	5	0,5	High demand for good quality beef
b	economic	Substantial percentage of local producers have the capacity or potential to produce the commodity competitively.	5%	3	0,15	"Viable & competitive for producers - potential is there but capacity limited Traditionally managed livestock is increasingly being commercialised Competitive against imports Limited rangeland?"
2	CATEGORY	VALUE-ADDITION	10%	Score	Weighted score	Justification
a	economic	Potential for value addition (up and downstream) - different options exist, there is existing capacity or potential for these different value-added products	10%	2	0,2	Currently limited
3	CATEGORY	INCOME, EMPLOYMENT & INCLUSION	20%	Score	Weighted score	Justification
a	economic	"Size of contribution to gross value of agricultural output "	5%	2	0,1	Still limited
b	economic	Current and prospective opportunities to integrate a significant number of producers and/or employees into the VC, with positive impact on HH income	10%	2	0,2	"Currently few but good potential for scaling up Grazing land and pasture management is a problem. Promoting fodder production"
c	social	Inclusion of disadvantaged groups esp. women, youth	5%	2	0,1	"Male dominated Some potential for youth involvement"
4	CATEGORY	"ENVIRONMENTAL/ HEALTH/FOOD SAFETY"	10%	Score	Weighted score	Justification
a	environment	Impact of the value chain functions on the environment (score low for negative environmental impact)	4%	2	0,08	Pasture management is a problem - can have negative impacts - overgrazing etc

b	environment	Resilience of the value chain functions to climate change / environmental factors (e.g. drought, erratic rainfall)	4%	3	0,12	Env has an impact on beef production
c	environment	Health/food safety risks to consumers (e.g. tobacco, groundnuts due to aflatoxin) (score low for high risk)	2%	2	0,04	Foot & mouth - risk but quite well managed
5	**CATEGORY**	**FOOD SECURITY & NUTRITION***	**10%**	**Score**	**Weighted score**	**Justification**
a	social	Contribution of VC to HH food security i.e. availability of sufficient calories, mainly referring to staple crops	5%	2	0,1	Litltle livestock consumption at HH level
b	social	Contribution to improved nutritional status at HH level e.g. improved dietary diversity	5%	3	0,15	High potential due to protein
6	**CATEGORY**	**NATIONAL PRIORITY & SUSTAINABILITY**	**20%**	**Score**	**Weighted score**	**Justification**
a	Institutional	Donor activity is currently supporting / has recently supported this VC	10%	2	0,2	Little going on - lots of potential for additionality but no synergies
b	Institutional	Coherence with National Policies	10%	3	0,3	National focus on beef
7	**CATEGORY**	**ACCESS TO FINANCE/ ADDITIONALITY (for FMT)**	**15%**	**Score**	**Weighted score**	**Justification**
a	Institutional	"There is currently good financial inclusion across the VC (therefore less scope for additionality for FMT) (score low for high level of financial inclusion)"	10%	4	0,4	Lack of financing is a serious constraint given capital-intensive nature of VC
b	Institutional	Opportunities to increase access to finance exist and can be capitalised on	5%	3	0,15	
TOTAL (max score = 5 points)			**100%**		**2,79**	
					56%	
Scores:	" 1 = Very poor/Very low ; 2 = Poor/Low ; 3 = Acceptable/Moderate ; 4 = Good/High ; 5 = Very good/Very high"					
	* If applicable - disregard category 5 for non-food commodities					

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