

**A review of the wheat value chains in Malawi: trends, gaps, challenges and opportunities**

Journal:	<i>CAB Reviews</i>
Manuscript ID	Draft
Manuscript Type:	Review
Keywords:	Wheat ( <i>Triticum aestivum</i> L), value chains, imports

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Manuscripts

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3 1 **A review of the wheat value chains in Malawi: trends, gaps, challenges and**  
4 2 **opportunities**

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24 14 **Abstract**

25  
26 15 Wheat (*Triticum aestivum* L.) is an important cereal crop, consumed by over 2.5 billion people  
27 16 globally. The current demand for wheat in Malawi is estimated to be 200,000 tonnes/year with  
28 17 a projected growth in consumption of 3–6% annually. We reviewed literature and databases on  
29 18 wheat production, imports, processing, marketing and consumption to describe current wheat  
30 19 value chains in Malawi, and to identify possible future economic and food security  
31 20 opportunities. The current gap between the supply and demand of wheat in Malawi is large  
32 21 with 99% imported due to low domestic production. The main actors in the value chain include  
33 22 importers, millers, commercial and small bakeries, biscuit manufacturers, wholesalers and  
34 23 retailers. In total, 45% of milled flour is utilised by commercial bakeries, 46% is distributed to  
35 24 rural and urban outlets through primary and secondary distributors, and biscuit manufactures  
36 25 utilise 9%. Although there is no information on wheat exports between 2016 and 2019, the  
37 26 Food and Agriculture Organization of the United Nations (FAO) statistical database  
38 27 (FAOSTAT) and the International Trade Centre (ITC) Trade Map databases show small  
39 28 quantities of wheat flour exports prior to 2016. Production constraints include the lack of a  
40 29 national wheat development strategy, lack of stable markets, unavailability of improved  
41 30 varieties, low input use, limited knowledge among technical staff in the management of wheat  
42 31 crops, and a lack of funds for research and development. Currency devaluation, transport and  
43 32 other logistical costs, and limited forex reserves further affect the annual volume of wheat  
44 33 imported and prices of wheat flour on the domestic market. We conclude that domestic  
45 34 production and wider value chain opportunities could be increased through policy support,

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3 35 including research for development, expansion of production into non-traditional wheat  
4 36 growing areas, development of improved and adaptable varieties, investing in irrigation, farmer  
5 37 incentives, and developing market systems.  
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10 39 **Key words:** Wheat (*Triticum aestivum* L.), value chains, production, imports, consumption  
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### 13 41 **Background**

14  
15 42 Wheat (*Triticum aestivum* L.) is a strategically important crop across Africa [1] where it  
16 43 accounts for over 20% of total calorie intake [2]. Over the last decade, annual wheat  
17 44 consumption in Africa has increased from approximately 59 million tonnes (MT) in 2009 to  
18 45 79 MT in 2018 [3, 4]. Mason et al. [5] identified a number of key drivers for rising wheat  
19 46 consumption in Africa which include, increase in GDP, population growth, wheat supplied  
20 47 through food aid and increased participation of women in the wider labour force, which makes  
21 48 women opt for wheat-based foods with short cooking time. Improved income at an individual  
22 49 level and the related shift in food consumption habits are also potential drivers to increased  
23 50 wheat consumption in African countries.  
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32 51 Growing demand for wheat in Africa is constrained by low domestic production. For example,  
33 52 in 2018 wheat consumption in Africa reached ~79 MT [4] but only 37% of this was produced  
34 53 within the continent [6]. To reduce the supply gap, the majority of the wheat consumed is  
35 54 imported, and over the last decade, wheat imports have risen from ~35.7 MT in 2009 to 44.7  
36 55 MT in 2018 [6]. Imports are projected to rise to 63 MT by 2028 [4]. Although total production  
37 56 increased from 19.6 MT in 2008 to 29.2 MT in 2019, and the total area under wheat increased  
38 57 from 8.5 to 10.2 million hectares [6], domestic supply is still much lower than demand. A 2018  
39 58 USDA report on global wheat imports shows that the sub-Saharan Africa (SSA) region has  
40 59 been a major driver of rising global wheat trade over the last decade. The year-over-year growth  
41 60 in wheat imports for SSA is greater than any region across the globe. Current annual production  
42 61 in SSA is ~7 MT [6] which accounts for only 28% of total annual demand.  
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51 62 Agricultural systems of Malawi are dominated by maize (*Zea mays* L.) and the wheat value  
52 63 chain is driven almost entirely by imports, which currently represent >99% of demand. In  
53 64 Malawi, wheat is used for making bread and scones, mostly consumed by people in urban areas,  
54 65 and *mandazi* which are consumed as snacks across rural and urban areas. Chapattis are also  
55 66 consumed in restaurants and among Asian communities. Imported products include wheat  
56 67 grain, flour, and wheat-based products such as breakfast cereals and pasta. In 2013, wheat  
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3 68 demand in Malawi was projected to increase by 6% annually [7], however current projections  
4 69 using FAOSTAT and ICT Trade Map import data for the past 10 years show an annual growth  
5 70 rate of 3%. Wheat production in Malawi has fluctuated over the past three decades, with a  
6 71 general increase from 1995 to 2007. However, average production has declined annually since  
7 72 2008 to less than 2000 tonnes in 2017 [6]. Wheat research has received little or no support for  
8 73 most of this period. A small National Research Station for wheat was established in Ntcheu  
9 74 district (fig. 3) in 1968 and remained active until 1980 [8]. Although the Department of  
10 75 Agricultural Research Services have evaluated a number CIMMYT wheat varieties on trial  
11 76 nurseries since the 1960s, little progress has been made to promote these varieties among  
12 77 smallholder farmers.

13 78 This review focuses on wheat value chains in Malawi, drawing on information from various  
14 79 databases, published papers, conference papers, unpublished research reports, unpublished  
15 80 thesis reports accessible online and short interviews with some value chain players. Import and  
16 81 export data were obtained from the Malawi Ministry of Industry and Trade (MIT), the Food  
17 82 and Agriculture Organization of the United Nations (FAO) statistical database (FAOSTAT)  
18 83 and the International Trade Centre (ITC) Trade Map database. Production data were sourced  
19 84 from the FAOSTAT databases and consumption data were taken from the Malawian National  
20 85 Statistical Office (NSO)/World Bank database.

## 21 86 **Wheat imports**

22 87 Wheat imports to Malawi from 2011–2019 are shown in Fig. 1. Wheat imports were largest in  
23 88 2015 (226,978 tonnes), which was likely associated with food shortages in the country. Zant  
24 89 [9] suggested that increase in cereal imports in specific years in Malawi arose due to food  
25 90 shortages associated with natural disasters; this was the case in 2014/15 and 2015/16 growing  
26 91 seasons [10]. A sharp decrease observed in the volume of wheat imported in 2012 was  
27 92 associated with a 34% devaluation of the Malawi kwacha by the Government of Malawi. [11].  
28 93 A decrease in imports of ~18% was seen from 2015 to 2016, 1% in 2017 and 21% in 2018  
29 94 while in 2019 imports rose by 11% from 143,069 tonnes to 160,000 tonnes.

30 95 Current annual wheat imports are valued at ~\$70 million. This value includes shipping to the  
31 96 nearest port but excludes port charges, freight within Malawi and import duties and taxes.  
32 97 According to the Malawi Revenue Authority Customs and Excise Act, Customs and Excise  
33 98 (tariffs) Order 2018, there is an exemption of import duties and taxes on all whole grain wheat  
34 99 imported into Malawi and resold, however a 20% import duty is applied for wheat flour and

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3 100 16.5% value added tax (VAT) for reselling [12]. Previously, a tax exemption was also made  
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5 101 for wheat flour imported for use in the food manufacturing industry. Naziri et al., [11]  
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7 102 suggested that this was one way of encouraging companies to manufacture biscuits and other  
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9 103 confectionaries locally.

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11 104  
12 105 The volume of imported wheat (Fig. 1) represents different categories of wheat and wheat  
13  
14 106 products. Millers usually import hard red winter wheat, soft red winter wheat and hard red  
15  
16 107 spring wheat grain [13]. Hard wheat has a high protein (12–15%) and gluten content (11–12%)  
17  
18 108 mostly used in breads and all-purpose flour as it develops strong elastic dough. Soft wheats  
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20 109 have low protein (8–12%) and gluten content (7–8%) [14, 15] and they are used for cake,  
21  
22 110 pastries and self-raising flour. Soft wheat can also be used as a blend for all-purpose flour.  
23  
24 111 From 2008 to 2014, millers imported only the cheaper soft wheat, while the hard winter wheat  
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26 112 was purchased in country through the USAID funded “Food for Peace” (PL 480) programme,  
27  
28 113 a US Government programme that provides donations of agricultural commodities to  
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30 114 International Organizations (IOs) and Non-Governmental Organizations (NGOs) to support  
31  
32 115 specific emergency and non-emergency food needs, either by monetization or for direct food  
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34 116 distribution [11, 13, 16]. Wheat flour and wheat products made from both durum and common  
35  
36 117 wheat (Fig. 2), i.e. pasta and breakfast cereals, are also imported by over 50 companies  
37  
38 118 including wholesalers, tea estates, sugar manufacturers, beverage companies, supermarkets and  
39  
40 119 bakeries [17]. Sergeant [13] reported that biscuit companies imported 15,000–20,000 tonnes of  
41  
42 120 wheat flour annually, although this may not be the case currently due to the duties levied on  
43  
44 121 imported of flour.

45  
46 122 Malawi imports wheat from different countries including Russia, Australia, Germany,  
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48 123 Argentina, Turkey, Canada, Latvia, the United Arab Emirates (UAE), USA and Mozambique  
49  
50 124 [17]. From 2015–2019, 34% of wheat was imported from the Russian Federation, 21% from  
51  
52 125 Canada, 13% from Switzerland, 12% from Australia, 5% from UAE and 15% from 14 other  
53  
54 126 countries contributing between 0.4–4%. Low prices of wheat in Russia compared to most EU  
55  
56 127 countries has increased its competitiveness on the global market, pushing low to middle income  
57  
58 128 countries to import most of their wheat from Russia [4].

## 59 129 **Transportation**

60 130 Malawi is a landlocked country and most imported goods come through the Nacala or Beira  
61 131 ports in Mozambique, the Dar es salaam port in Tanzania and some through the Namibian

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3 132 ports. Wheat often comes from Nacala port through the Nacala corridor; a 912 km railway line  
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5 133 that comes through Liwonde in southern Malawi, to Mchinji in the Central Region.  
6  
7 134 Transporting goods from Nacala to Malawi is cheaper compared to the Beira port [13]. From  
8  
9 135 Nacala, millers use both road (trucks) and rail to transport their consignments [11, 18].  
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11 136 Although rail transport is considered cheaper and helps to increase the profit margins on wheat  
12  
13 137 flour, it is not always available for all consignments [13].

### 14 138 **Wheat production in Malawi**

15  
16 139 Wheat was introduced in Malawi in the 1870s [8, 19], and it is mostly grown by smallholder  
17  
18 140 farmers in the high-altitude areas (>1500 masl). The crop is mainly cultivated under residual  
19  
20 141 moisture and rain showers during the cool months of April to August. Primary crops such as  
21  
22 142 maize, rice (*Oryza sativa* L.), groundnut (*Arachis hypogaea* L.) and common bean (*Phaseolus*  
23  
24 143 *vulgaris* L.) are cultivated under rainfed conditions in the months of November to April. Land  
25  
26 144 under cultivation of wheat is estimated to be less than 3000 ha (FAOSTAT, 2020), however,  
27  
28 145 an estimated 30,000 ha land is suitable for wheat production in Malawi [20, 21]. Three wheat  
29  
30 146 varieties (*Kenya nyati*, *Kadzibonga* and *Nduna*) are the most widely cultivated across the wheat  
31  
32 147 production areas. *Kenya nyati* and *Kadzibonga* were released in the early 1980s and lost  
33  
34 148 resistance to leaf and stem rust [20, 22], while *Nduna* was introduced in 2007/08 by SeedCo,  
35  
36 149 one of Malawi's largest seed companies (Kamalongo D., personal communication, 5 June  
37  
38 150 2020). Land currently under maize is estimated at 1.7 million ha and forms the bulk of the  
39  
40 151 countries' cereal output. Use of improved maize varieties and fertilisers has increased since  
41  
42 152 2005/06 when the Farm Input (seed and fertiliser) Subsidy Program (FISP) was introduced.  
43  
44 153 This has resulted in increased production and productivity of maize [23]

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46 154 Wheat is grown mostly within the Districts of Ntcheu, Neno, Dedza, Chitipa, Rumphi, and  
47  
48 155 Zomba (Figure 3). The areas are suitable for wheat production due to existing weather patterns,  
49  
50 156 for example Dedza to Ntcheu usually has minimum temperatures of 9–14°C and maximum  
51  
52 157 temperatures of between 20–22°C degrees within the growing months of May–August. Daily  
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54 158 rainfall in the form of light showers usually ranges from 1.5–6.2 mm within the growing  
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56 159 season. Zomba has minimum temperatures of 11–16°C and maximum temperatures of 23–  
57  
58 160 27°C, with 0.3–1.9 mm rainfall across the growing season.

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## 164 **Seed systems**

165 There are no formal seed production and distribution systems for wheat in Malawi. Farmers  
166 usually save seeds and perform farmer-to-farmer exchange every season. Currently, private  
167 seed companies are not involved in marketing of wheat seed. Previous reports and an interview  
168 with a SeedCo sales and marketing manager show that SeedCo Malawi head office in Lilongwe  
169 was importing the varieties SC Select and SC Nduna from SeedCo Zimbabwe for evaluation  
170 and promotion between 2006 and 2009, however the lack of a stable market forced the company  
171 to stop importing and stocking seed (Kamalongo D., personal communication, 5 June, 2020;  
172 W. Lipenga, personal communication, 2 June 2020). A focus group discussion with farmers in  
173 Tsangano and Mwera Hills area in Tcheu district and showed that some farmers buy preferred  
174 wheat seed varieties from Mozambique, which is few kilometres away from some parts of  
175 Ntcheu district [22].

## 176 **Production Levels**

177 There has been a general decline in wheat production since 2007 (Fig. 4), with total annual  
178 production below 2000 tonnes since 2011. The much larger production in 2007, was attributed  
179 to the Clinton Hunter Development Initiative project, which focused on increasing wheat  
180 productivity through improved varieties, subsidized fertiliser, capacity building in best  
181 agronomic practices and linking farmers to millers offering premium prices (A. Ngwira,  
182 personal communication, 10 June 2020). An average yield of 1.2 tonnes/ha has been recorded  
183 from 2014–2018 (Table 1). The yield gap is very wide compared to some countries in the  
184 southern Africa, for example, Zambia with a national average of 6.6 tonnes/ha, Namibia 5.6  
185 tonnes/ha, South Africa 3.4 tonnes/ha, and Zimbabwe 2 tonnes/ha [6]. Differences in yields  
186 could be attributed to less use of improved varieties, low input use, heavy reliance on rainfed  
187 production, poor agronomic practices, lack of extension support and climate and soil factors.

## 188 **Marketing**

189 In 2019 wheat farmers were selling wheat grain to vendors at US\$350 per/tonne (C. Gausi,  
190 personal communication, 12 June 2020). The vendors in turn sold the wheat to milling  
191 companies. Some of the wheat is sold and milled locally for household consumption and for  
192 making *mandazi* (a deep fried sweet and fluffy snack made from wheat, yeast/baking powder  
193 and sugar), *kanyenya* (a deep-fried fish snack made of small *cichlid* fish dipped in a mixture of  
194 wheat flour, salt and curry powder) and *madonasi* (doughnuts), often by women operating  
195 small scale businesses. In the case of wheat grown by households, wheat flour is also mixed

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3 196 with maize flour and used for cooking *nsima*, Malawi's staple food, which is made from a  
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5 197 mixture of water and milled whole kernel maize/corn known as *mgaiwa* or maize milled with  
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7 198 refined flour where the outer kernel shell and seed germ have been removed, locally known as  
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9 199 *ufa oyera*.

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### 201 **Challenges in wheat production**

202 The challenges for wheat production among farmers in the Tsangano and Mwera Hills in  
203 Ntcheu district have been studied using focus group discussions [22]. Farmers reported  
204 unavailability of improved varieties, low input use, insufficient extension services, lack of  
205 stable markets for their grain, post-harvest losses due to weevils and mice, shattering of some  
206 varieties and birds eating the grains and especially the awnless varieties. Insufficient extension  
207 services and unstable markets have led to the younger generation not participating in wheat  
208 production and leaving it to the older generation. According to the Department of Agriculture  
209 Extension Services and (DAES) and Department of Agriculture Research (DARS), the lack of  
210 a national crop development strategy, limited knowledge and skills by technical staff in  
211 production and management of wheat crop, lack of funds for research and development, lack  
212 of recommended improved varieties for local and export market production, low investments  
213 in irrigation facilities and lack of a proper seed system affects wheat production in the country  
214 (S. Magomero and Kamalongo D., personal communication, 5 June, 2020)

### 215 **The wheat value chain**

216 The wheat value chain in Malawi is controlled by importers. Wheat millers, distributors  
217 (wholesalers, retailers, supermarkets, and grocery stores), commercial and small bakeries,  
218 wheat-based product manufacturers and consumers are other key actors in the chain. The value  
219 chain has been summarised in Figure 6 and it represents all the possible market channels from  
220 production, milling to end use. Information from multiple reports, online articles and personal  
221 communication have been used to make the figure.

### 222 **Millers/processors**

223 The milling industry is comprised of three main companies: Capital Foods Limited  
224 (<http://www.capitalfoodsmw.com/>) in Lilongwe, in the Central Region, and Bakhresa Grain  
225 and Milling (<http://bakhresa.com>) and HMS Foods Grain Limited (<http://hmsmalawi.net/>) in



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3 226 Blantyre, in the southern region. Bakhresa Grain and Milling (BGM) also has branches in  
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5 227 Lilongwe and Mzuzu in the northern region. Bakhresa began with a 250 tonnes per day capacity  
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7 228 mill in 2003 but doubled its capacity to 500 tonnes/day with another 250 tonnes/day capacity  
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9 229 mill in 2011 [18]. At full operation capacity, BGM mills 400 tonnes/day [11]. Capital Foods  
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11 230 started with a 200 tonnes/day mill and doubled its capacity to 400 tonnes/day in 2010 [13]  
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13 231 while HMS has a capacity of 200 tonnes/day. In 2013, BGM had a national market share of  
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15 232 80% [7]. Across the regions, BGM had 90% market share in the south, 50% in the central  
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17 233 region and 75% in the north [18]. The types of flour that the three mills package include brown  
18  
19 234 bread, all-purpose bread, biscuit, cake flour and special *mandazi* flour by HMS. Flour package  
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21 235 sizes from all companies range from 2, 5, 10, 25 and 50 kg depending on the target market.  
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23 236 Millers use different primary and secondary market channels via wholesalers and retailers to  
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25 237 reach consumers.

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### 239 **Wholesalers**

240 About 50% of the processed wheat is distributed through wholesale channels as the primary  
241  
242 distributors. For example, BGM distributes through four major wholesalers: Rab Processors  
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244 Limited, Right Price and Woollies in Blantyre, and Farmers World in Lilongwe, together have  
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246 a total of over 110 retail outlets across the country in both rural and urban areas [18]. The  
247  
248 wholesalers target markets are small/rural bakeries, retailers and individuals who make  
249  
250 products such as *mandazi* for selling on.

### 251 **Retailers**

252 Retail shops are the secondary distributors of wheat in Malawi. They are supplied by wholesale  
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254 outlets and sometimes directly by millers from their headquarters. Local grocery stores and  
255  
256 roadside vendors are the major retailers of wheat flour. Their target markets are small to  
257  
258 medium sized businesses, typically run by women entrepreneurs selling *mandazi* for home  
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260 consumption. According to Naziri et al. [11], 40% of the wheat flour milled in Malawi is used  
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262 for making *mandazi*. In the BGM business model, retailers take up 90% of the BGM wheat  
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264 flour distributed by wholesalers and about 20% of the flour directly sold by BGM at its  
265  
266 headquarters in Blantyre [18]. Apart from wheat flour, local grocery stores and roadside  
267  
268 vendors also sell imported wheat products, especially pasta.

269 Supermarkets sell wheat flour, pasta and breakfast cereals. The main supermarkets which are  
270  
271 mostly located in main cities (Blantyre, Lilongwe, Zomba and Mzuzu) of Malawi include

258 Shoprite, Sana, Chipiku and Peoples. Wheat millers distribute flour directly to supermarkets in  
259 2, 5 and 10 kg packages (Bakhresa 2020; HMS, 2018; Capital Foods, 2020). Supermarkets also  
260 stock other imported cake flour brands, pasta and breakfast cereals.

### 261 **Biscuit and confectionary manufacturers**

262 Wheat millers distribute wheat flour directly to biscuits and confectionary companies. Four  
263 manufacturers, Universal Industry, Bakeman's Limited, Cresta and Bakelines Limited, absorb  
264 9-10% of total wheat flour from millers [11, 13]. Universal Industries has a bigger market share  
265 and fulfils over 60% of the total wheat flour demand from the biscuit manufacturers.  
266 Bakeman's absorb 25% and the rest is shared between Cresta and Bakelines [11, 13]. Previous  
267 reports show that some biscuit manufactures directly imported flour from Turkey (J. Pankuku,  
268 personal communication, 31 May 2020) and Tanzania [13]. Currently biscuit companies  
269 depend on local production although prices on the local market are considerably higher  
270 compared to the international market (K. Mittal, personal communication, 9 June 2020).

### 271 **Commercial bakeries**

272 Millers supply wheat flour directly to commercial bakeries. In Malawi most commercial  
273 bakeries operate in groups of several affiliated individual bakeries. Mother's Pride and Royal  
274 products in the southern region and Baker's Pride in the Central and Northern Regions are the  
275 main commercial bakery groups. From 2009 to 2013, commercial bakeries were using about  
276 45% of the wheat flour from millers [11, 13]. BGM alone supplied 90% of the total volume  
277 [18]. Bakeries use wheat flour to make bread, scones, cakes and pastries which are sold to  
278 supermarkets and retail outlets in rural and urban areas.

### 279 **Market segmentation for wheat flour**

280 According to estimates made using the 2012 wheat flour balance sheet [11], commercial  
281 bakeries accounted for 45% of the total wheat flour, rural outlets 32%, while urban outlets take  
282 up 14% and the rest is used by the biscuit companies. Wholesalers and retailers account for  
283 over 90% of rural and urban outlet distribution and the rest is directly distributed by millers.  
284 Although there has been a growth of wheat imports and consumption since 2012, the market  
285 segmentation may still reflect the current situation.

### 286 **Domestic wheat flour prices**

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3 287 Prices for wheat flour tend to fluctuate depending on the cost of production and importation.  
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5 288 Final wholesale price is determined by the cost of freight from the country of importation to  
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7 289 the mill, port charges, custom clearance charges, administrative costs and cost of processing  
8  
9 290 and packaging[11, 13]. At the beginning of 2020 the cost of wheat flour was K27,960 per 50  
10  
11 291 kg bag which is K559,960/tonne (US\$760 in 2020, exchange rate of \$1:KWM751).

## 12 292 **Exports**

13  
14 293 Small quantities of milled (from imported grain) and packaged wheat flour are exported from  
15  
16 294 Malawi to Asia and other African countries (Table 2). Top export market destinations include  
17  
18 295 Mozambique, Zimbabwe, Zambia and South Africa. According to the ITC Trade Map and  
19  
20 296 FAOSTAT databases, the highest volume exported was 11,213 tonnes valued at US\$183  
21  
22 297 million in 2011 and 2012. In 2009, Capital Foods Limited and Bakhresa estimated an export  
23  
24 298 quantity of ~5,000 tonnes/year of wheat flour each to Zambia and Zimbabwe [13]. Export  
25  
26 299 volumes for wheat flour have likely reduced over the years due to the establishment of BMG  
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28 300 Mozambique [11] which exports wheat flour to neighbouring Zimbabwe and South Africa.

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32 302 FAOSTAT and ICT Trade Map data (Table 3) also show fluctuating wheat bran exports valued  
33  
34 303 at less than \$4 million annually from the period of 2010–2018. Interestingly, the volume and  
35  
36 304 value of wheat bran exported annually surpasses that of wheat flour. In Malawi, wheat millers  
37  
38 305 sell some of the wheat bran locally to livestock feed manufacturers and the bulk of it is exported  
39  
40 306 to feed industries in other countries (E. Nyirongo, personal communication, August 15, 2020).  
41  
42 307 Top export destinations for wheat bran include South Africa, Zimbabwe, and lately Botswana,  
43  
44 308 and these countries also rank highly in maize bran imports from Malawi.

## 45 309 **Consumption**

46  
47 310 In Malawi, the contribution of wheat to total dietary energy is less than 10% and fluctuates  
48  
49 311 because of low domestic production and high costs of imports [9]. This is low compared to  
50  
51 312 Africa more broadly, where wheat provides about 20% of total calorie intake[5].

52  
53 313 Wheat consumption data recorded at household level were extracted from the Third (IHS3) and  
54  
55 314 Fourth (IHS4) Integrated Household Surveys of Malawi [24, 25]. Data extraction was done  
56  
57 315 using methods reported in Joy et al (2015). A majority of wheat in Malawi is consumed in the  
58  
59 316 form of bread, buns/scones and *mandazi* and scones (Table 4). In 2010/11, on average per day,  
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317 individuals (per Adult Male Equivalent, AME) consumed 69 g of bread, 34 g of buns/scones,

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3 318 24 g of pasta and 15 g of *mandazi*. In 2017 average consumption increased by 7% for bread  
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5 319 (69 to 74 g per AME per day), 350% for pasta (24 to 108 g per AME per day) and 29% for  
6  
7 320 wheat flour for home cooking (77 to 99 g per AME per day). In 2010/11, 21% of the sampled  
8  
9 321 households consumed buns/scones, 23% *mandazi*, 16.9% bread and <2% pasta (Table 5).  
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11 322 Bread consumption increased by 5% from 2010/11 to 2016/17 (17 to 22%). *Mandazi*  
12  
13 323 consumption increased by 11% (23 to 34%) while scones/buns consumption decreased by 7%  
14  
15 324 (21 to 14%). Across socioeconomic positions, bread, buns/scones, breakfast cereals and pasta  
16  
17 325 consumption were higher in wealthier households, i.e. those in the 4<sup>th</sup> and 5<sup>th</sup> highest total  
18  
19 326 annual household expenditure quintiles. For example, 42% of households in the wealthiest fifth  
20  
21 327 of the population consumed bread in 2010/11 and 65% in 2016/17, while the equivalent values  
22  
23 328 for pasta were 4% in 2012 and 19% in 2017. *Mandazi* consumption was constant across all  
24  
25 329 socioeconomic positions between the survey years with consumption increasing incrementally  
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27 330 from the poorest to wealthiest groups. Between 2010/11 and 2016/17, *mandazi* consumption  
28  
29 331 also increased consistently across all socioeconomic positions. The consumption pattern for  
30  
31 332 *mandazi* is in line with the findings of Naziri et al.,[11] where 40% of all milled flour in Malawi  
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33 333 was reported for use in making *mandazi*.  
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35 334 Data on wheat consumption by urban versus rural residency shows that bread and pasta are  
36  
37 335 mostly consumed by the urban population (Table 6). The percentage of households consuming  
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39 336 *mandazi* and buns/scones was similar for rural and urban dwellers. Between, 2010/11 and  
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41 337 2016/17, consumption of all the products by urban households increased by over 30% except  
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43 338 for buns/scones which decreased from 29% in 2010/11 to 19% in 2016/17.

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### 340 **Wheat research**

341 Wheat research in Malawi's National Agricultural Research System comes under the Cereals  
342 Section (small grains) in the Department of Agriculture Research Services, in the Ministry of  
343 Agriculture. Wheat breeding has never been undertaken formally in Malawi since its  
344 introduction. Varieties that have been tested and released were from CIMMYT- Mexico yield  
345 nurseries, while some were introductions from Kenya, Zimbabwe and South Africa [20, 21].  
346 Seed Co. bred varieties SC Shine, SC Nduna, SC Smart, SC Stallion, SC Shield and SC  
347 Shangwa, were also introduced and tested at the research stations (Kamalongo D., personal  
348 communication, 5 June 2020)

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3 349 Previous trials focused on selecting early maturing (less than 150 days) and high yielding  
4 350 varieties that were ecologically suited to conditions in Malawi with high levels of resistance to  
5 351 major wheat diseases and lodging [19, 26]. Trials to determine fertilizer requirements, time of  
6 352 planting, performance in traditional and non-tradition wheat growing areas and rainfed and  
7 353 irrigated winter conditions were also conducted [8, 22, 27].  
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12 354 Wheat research has been limited in Malawi due to lack of funds and policy support, although  
13 355 in recent years Lilongwe University of Agriculture and Natural Resources (LUANAR) has  
14 356 been collecting and evaluating wheat germplasm from all wheat growing areas. On station  
15 357 performance studies showed yield performance of 1.8 to 2.7 tonnes/ha in early planted winter  
16 358 irrigated trials and 0.75 to 1.0 tonnes/ha in late planting trials (M. Maliro, unpublished  
17 359 observations). Chitedze Agriculture Research Station have started evaluating CIMMYT-  
18 360 Mexico nurseries and varieties for abiotic and biotic stresses under irrigation since May 2018  
19 361 winter season.  
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### 26 27 362 **Challenges, opportunities and future prospects**

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29 363 Annual demand for wheat and wheat products in Malawi will keep rising over time. A ten-year  
30 364 projection trend using import data from 2011–2019 shows a 3% annual growth rate in wheat  
31 365 demand. The figures are likely to increase further due to population growth, economic growth  
32 366 and increased urbanization. Consumption data from IHS3 (2010/12) and IHS4 (2016/17)  
33 367 indicates high consumption of wheat in urban areas compared to rural areas and thus increased  
34 368 urbanization will tend to further increase wheat demand. Although Mason et al. [5] did not find  
35 369 a statistical significance between urbanization and increased wheat consumption at country  
36 370 level in SSA, they argued that urbanization could still be a driver to increased wheat  
37 371 consumption. Change in eating habits and increase in household income overtime will also  
38 372 increase consumption of other wheat products for example, IHS3 and IHS4 data also show an  
39 373 increase of up to 375% in some of the wheat products such as pasta.  
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48 374 Population growth in Malawi will likely be another driver to increased demand for wheat.  
49 375 Current population in Malawi is at 18.14 million and is projected to rise to 40% by 2070 [28].  
50 376 Mason et al. [5] showed that a 1,000-person increase in total population raises a country's  
51 377 wheat consumption by 30 to 50 MT, other factors being constant. Although the figures are too  
52 378 high for Malawi, a combination of several drivers is likely to increase the demand for wheat  
53 379 and wheat products.  
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58 380 The projected increase in wheat demand in Malawi suggests that the country needs to increase  
59 381 imports or domestic production. Increasing wheat imports will potentially drain the country's  
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3 382 foreign exchange reserves which are already limited. Tadesse et al. [29] argued that wheat  
4 383 imports by African countries is not always easy and reliable, as it depends on the availability  
5 384 of wheat on the global market, political stability and ability to compete in cases of price shocks.  
6  
7 385 Negassa et al. [1] studied the potential economic profitability of wheat production in African  
8 386 countries and from their findings they concluded that wheat production in African countries  
9 387 could be economically profitable with proper policy support, strengthened wheat seed systems,  
10 388 input supply systems, extension services and improved market structures.

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16 389 In Malawi, the lack of a wheat crop development strategy, a lack of policy support, over  
17 390 reliance on rainfed production, and under-developed market structures have forced most  
18 391 smallholder farmers to abandon wheat farming. Reports shows that only 10% of land suitable  
19 392 for wheat production is under cultivation [21]. However, the area under cultivation has likely  
20 393 decreased in the past 8 years as reflected in the annual production figures. Although there is no  
21 394 policy support for domestic wheat production in Malawi, there is potential to increase wheat  
22 395 production and productivity by taking advantage of existing policies and strategies that focus  
23 396 on increased agriculture productivity and development of irrigation structures. The Malawi  
24 397 Growth and Development Strategy MDGS III (2017–2022) identifies agriculture, water  
25 398 development and climate change as one of eight key priority areas. Key strategies for achieving  
26 399 these goals include increasing agricultural productivity and increase land under irrigation by  
27 400 developing areas with irrigation potential and promoting infrastructural investment in large  
28 401 scale irrigation. The National Agriculture Policy (2016–2021) and National Irrigation Policy  
29 402 (2016–2020) both support increasing land under irrigation which is currently at 29% of the  
30 403 407,862 ha potential land area. Another opportunity to boost wheat production in Malawi is to  
31 404 take advantage of government efforts on shifting from subsistence farming to  
32 405 commercialization. With a well organised market system, commercial farmers can afford  
33 406 irrigation and all necessary inputs thus increasing wheat production and productivity.

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47 407 Development of irrigation facilities for wheat production coupled with access to subsidized  
48 408 inputs/input loans and well-developed markets have potential to boost both production and  
49 409 productivity of wheat in Malawi. In Zimbabwe, where wheat is produced under irrigation in  
50 410 the winter months of May to October [30], 28 to 50% of annual demand is supplied through  
51 411 domestic production [31] and average yields are higher than other countries in the sub-Saharan  
52 412 Africa region [1]. Shiferaw et al., [32] and Tadesse et al., [29] have shown that Malawi,  
53 413 Zimbabwe and Zambia fall under the same wheat production mega environment suitable for  
54 414 irrigated winter production.

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3 415 One recommendation for economically profitable wheat production in Africa is to exploit the  
4 416 non-traditional wheat growing areas The Ecocrop wheat suitability map for Africa [1] shows  
5 417 that most parts of Malawi are suitable for wheat production, thus there is a need to exploit the  
6 418 potential of winter irrigated production in non-traditional growing areas. Winter irrigated trials  
7 419 in non-tradition growing areas such as Bunda in Lilongwe, Kasinthula in Chikwawa and  
8 420 Bvumbwe in Thyolo have shown average yields of 1.5-9.0 tonnes/ha ( Maliro unpublished  
9 421 data; Bisiwasi, unpublished data) which is 2 to 7-fold higher compared to yields on farmers'  
10 422 fields. Further evaluation and strengthening of wheat research in Malawi will also play an  
11 423 important role in improving wheat production. To address production challenges cited in this  
12 424 review, priority areas of research could include developing or introducing high yielding  
13 425 varieties with excellent end use quality, drought tolerant diseases and pest resistance.  
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#### 427 **Funding statement**

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27 428 This work was supported by a studentship funded by the Future Food Beacon of Excellence,  
28 429 University of Nottingham, UK (VFG). Additional support was provided by the Bill & Melinda  
29 430 Gates Foundation Micronutrient Action Policy Support (MAPS) project (INV-002855) (MRB,  
30 431 EJMJ, KT). Rothamsted Research and the University of Nottingham receive strategic funding  
31 432 from the Biotechnology and Biological Sciences Research Council as part of the Designing  
32 433 Future Wheat project [grant number BB/P016855/1] (MJH, JK).  
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**REFERENCES**

1. Negassa A, B. Shiferaw, Jawoo Koo, K. Sonder, M. Smale, Braun HJ, et al. The Potential for Wheat Production in Africa: Analysis of Biophysical Suitability and Economic Profitability. Mexico, DF (Mexico) <http://hdlhandle.net/10883/4015>. 2013.
2. FAO. World food situation. Food and Agriculture Organization of The United Nations (FAO) <http://www.fao.org/worldfoodsituation/en/>. 2019.
3. USDA-FAS. "Grain: World Markets and Trade." World Production, Markets, and Trade Reports," Large global barley production drives prices down. United States Department of Agriculture Foreign Agricultural Services (USDA-FAS) <http://www.fas.usda.gov/data/grain-world-markets-and-trade>. 2010.
4. USDA-FAS. "Grain: World Markets and Trade." World Production, Markets, and Trade Reports," Sub-Saharan Africa Drives Growth in Global Wheat Imports. United States Department of Agriculture Foreign Agricultural Services (USDA-FAS) <http://www.fas.usda.gov/data/grain-world-markets-and-trade>. 2018.
5. Mason NM, Jayne T, Shiferaw B. Africa's Rising Demand for Wheat: Trends, Drivers, and Policy Implications. Dev Policy Rev. 2015;33:581-613.
6. FAOSTAT. Food and Agriculture Organization of The United Nations (FAO). [http://faostat3.fao.org/browse/T/\\*/E](http://faostat3.fao.org/browse/T/*/E) 2020; Accessed 22 July, 2020.
7. IFC. Inclusive business company profile: Bakhressa Grain Milling Malawi. International Finance Corporation (IFC)-World Bank [https://www.ifc.org/wps/wcm/connect/Topics\\_Ext\\_Content/IFC\\_External\\_Corporate\\_Site/Inclusive+Business](https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Inclusive+Business). 2012.
8. Mnyenyembe P. Wheat production and constraints in Malawi. In: The Fifth Regional Wheat Workshop for Eastern, Central and Southern Africa Arusha, Tanzania, June 13-17, 1983. CIMMYT, Mexico. 1983:32-4.
9. Zant W. Food import risk in Malawi: simulating a hedging scheme for food imports using historical data. Report to the Food and Agricultural Organization of the United Nations (FAO), Vrije Universiteit, Amsterdam. 2005.
10. GoM. Malawi drought 2015-2016 post-disaster needs assessment (PDNA). Government of Malawi (GoM) [https://www.recoveryplatform.org/assets/publication/PDNA/CountryPDNAs/Malawi\\_Drought\\_2016\\_PDNAPDF](https://www.recoveryplatform.org/assets/publication/PDNA/CountryPDNAs/Malawi_Drought_2016_PDNAPDF). 2016.



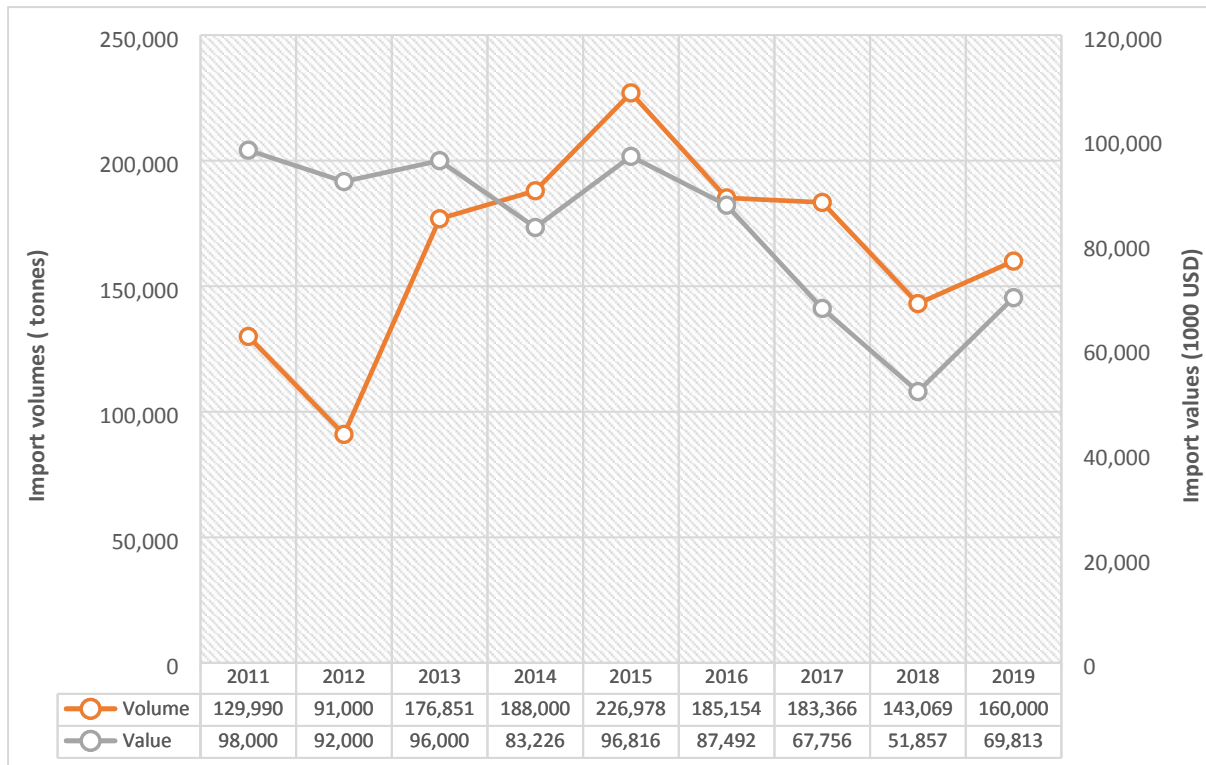
- 1  
2  
3 477 11. Naziri D, Abayomi L, Sandifolo V, Kaitano V, Sergeant A. Market opportunities for  
4 478 cassava in Malawi. A report submitted to the Cassava: Adding Value for Africa (C: AVA)  
5 479 project, Natural Resources Institute, University of Greenwich, Chatham Maritime, Kent. 2013.  
6  
7 480 12. GoM. Customs and Excise Act (chapter 42:01) Customs and Excise (Tariffs) (No. 3)  
8 481 Order, 2018. Government of Malawi (GoM)  
9 [https://www.mramw/assets/upload/downloads/MALAWI\\_CUSTOMS\\_AND\\_EXCISE\\_TARIFF\(HS\\_2017\\_Version\)\\_2019-2020\\_updated2pdf](https://www.mramw/assets/upload/downloads/MALAWI_CUSTOMS_AND_EXCISE_TARIFF(HS_2017_Version)_2019-2020_updated2pdf). 2019.  
10  
11 482  
12 483  
13 484 13. Sergeant A. Market and financial observation for HQCF in Malawi. A report submitted  
14 485 to the Cassava: Adding Value for Africa (C: AVA) project, Natural Resources Institute,  
15 486 University of Greenwich, Chatham Maritime, Kent. 2009.  
16  
17 487 14. Kasarda DD. Can an increase in celiac disease be attributed to an increase in the gluten  
18 488 content of wheat as a consequence of wheat breeding? J Agric Food Chem. 2013;61(6):1155-  
19 489 9.  
20  
21 490 15. Shewry PR, Hey SJ. The contribution of wheat to human diet and health. Food and  
22 491 energy security. 2015;4(3):178-202.  
23  
24 492 16. Schnepf R. U.S. International Food Aid Programs: Background and issues.  
25 493 Congressional Research Service 7-5700, www.crs.gov R41072. 2016.  
26  
27 494 17. ITC. The International Trade Centre (ITC) Trade map.  
28 495 [http://www.somalawimw/index.php?option=com\\_wrapper&view=wrapper&Itemid=110](http://www.somalawimw/index.php?option=com_wrapper&view=wrapper&Itemid=110)  
29 496 2020; Accessed July 26, 2020.  
30  
31 497 18. Nagasaki T. Reaching the base of the pyramid: an analysis of Bakhresa Grain Milling  
32 498 Malawi's inclusive business model. Master's Degree thesis submitted at The Fletcher School,  
33 499 Tufts University <https://dltufts.edu/concern/pdfs/2801ps87t>. 2013.  
34  
35 500 19. Mkamanga GY, Munthali FC, Chafika KM, . Smallholder wheat production and  
36 501 research in Malawi. In: The Fifth Regional Wheat Workshop for Eastern, Central and Southern  
37 502 Africa and the Indian Ocean Njoro, Kenya, September 2-5, 1985. CIMMYT, Mexico. 1985:33-  
38 503 8.  
39  
40 504 20. Ganunga RP. Screening and evaluation of high yield wheat varieties for sustainable  
41 505 wheat production in Malawi. Conference paper for the 4th International Crop Science  
42 506 Conference for Africa October 11-14, 1999 Casablanca, Morocco 1999.  
43  
44 507 21. Kamalongo D. Wheat production in Malawi. 2012.  
45  
46 508 22. Kamanga K. Performance of local bread wheat (*Triticum aestivum* L.) varieties in two  
47 509 different environments of Malawi. Master's Degree thesis submitted at The University of  
48 510 Malawi, Bunda College of Agriculture. 2013.

- 1  
2  
3 511 23. Dorward A, Chirwa E. The Malawi agricultural input subsidy programme: 2005/06 to  
4 512 2008/09. *International Journal of Agricultural Sustainability*. 2011;9(1):232-47.
- 5  
6 513 24. NSO. Malawi Third Integrated Household Survey (IHS3). National Statistics Office  
7 514 (NSO) of the Republic of Malawi, Zomba, Malawi and World Bank Living Standards and  
8 515 Measurements Surveys  
9  
10 516 [http://econworldbankorg/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,](http://econworldbankorg/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,contentMDK:23590235~pagePK:64168445~piPK:64168309~theSitePK:3358997,00html)  
11  
12 517 [contentMDK:23590235~pagePK:64168445~piPK:64168309~theSitePK:3358997,00html](http://econworldbankorg/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,contentMDK:23590235~pagePK:64168445~piPK:64168309~theSitePK:3358997,00html).  
13  
14 518 2012; Accessed September 2013.
- 15  
16 519 25. NSO. Malawi Third Integrated Household Survey (IHS3). National Statistics Office  
17 520 (NSO) of the Republic of Malawi, Zomba, Malawi and World Bank Living Standards and  
18 521 Measurements Surveys <https://microdataworldbankorg/indexphp/catalog/2936>.  
19 522 2017; Accessed September 1, 2020.
- 20  
21 523 26. Chafika KM, Kauwa A. Wheat Project Annual Report in J.D.T Kumwenda and M.K.M  
22 524 Komwa. Annual research project for cereals commodity group. Ministry of Agriculture and  
23 525 irrigation, Lilongwe, Malawi. 1998; Vol 11.
- 24  
25 526 27. Munthali FC. Effect of time of planting on the grain yield and yield components of  
26 527 rainfed wheat grown at three locations in Malawi. In: The Sixth Regional Wheat Workshop for  
27 528 Eastern, Central and Southern Africa and the Indian Ocean. Addis Ababa, Ethiopia, October  
28 529 2-6, 1989. . CIMMYT, Mexico. 1989:90-5.
- 29  
30 530 28. GoM. The Malawi Growth and Development Strategy (MGDS) III: Building a  
31 531 Productive, Competitive and Resilient Nation. Government of Malawi (GoM)  
32 532 [https://www.afidep.org/publication/malawi-growth-development-strategy-mgds-iii-2017-](https://www.afidep.org/publication/malawi-growth-development-strategy-mgds-iii-2017-2022/)  
33 533 [2022/](https://www.afidep.org/publication/malawi-growth-development-strategy-mgds-iii-2017-2022/). 2017.
- 34  
35 534 29. Tadesse W, Bishaw Z, Assefa S. Wheat production and breeding in Sub-Saharan  
36 535 Africa: Challenges and opportunities in the face of climate change. *International Journal of*  
37 536 *Climate Change Strategies and Management* Emerald Publishing Limited DOI  
38 537 101108/IJCCMC-02-2018-0015 2018.
- 39  
40 538 30. Macrobert JF, Savage MJ. The use of crop simulation model for planning wheat  
41 539 irrigation in Zimbabwe. In: Tsuji G.Y., Hoogenboom G., Thornton P.K (eds) *Understanding*  
42 540 *options for agricultural production. Systems approaches for sustainable Agricultural*  
43 541 *production*, . Springer, Dordrecht. 1998;7.
- 44  
45 542 31. USDA-FAS. Grain Feed Annual report for Zimbabwe. United States Department of  
46 543 Agriculture Foreign Agricultural Services (USDA-FAS)  
47 544 <https://www.fas.usdagov/commodities/grain-and-feed>. 2017.

1  
2  
3 545 32. Shiferaw B, Negassa A, Koo J, wood J, Sonder K, Brown JA, et al. Future of wheat  
4  
5 546 production in sub-Saharan Africa: Analysis of the expanding gap between supply and demand  
6  
7 547 and economic profitability of domestic production. Paper presented at Increasing Agricultural  
8  
9 548 Productivity and Enhancing Food Security in Africa: New Challenges and Opportunities  
10 549 <https://ccafscgiarorg/publications/future-wheat-production-sub-saharan-africa>. 2011.  
11  
12

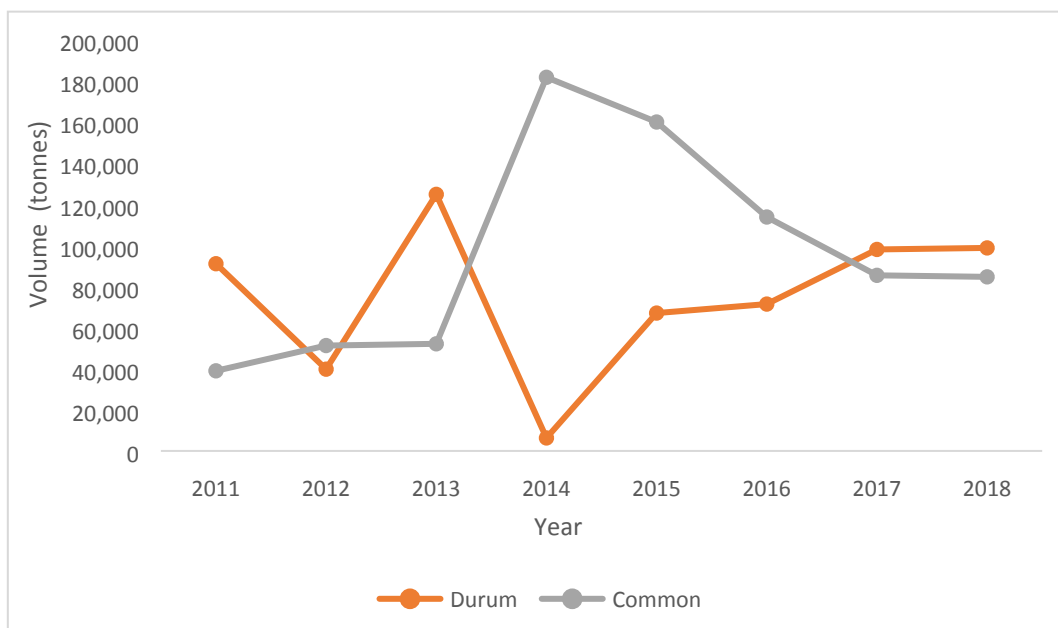
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For Review Only



**Figure 1:** Annual import volumes and values of wheat in Malawi between 2011 and 2019.

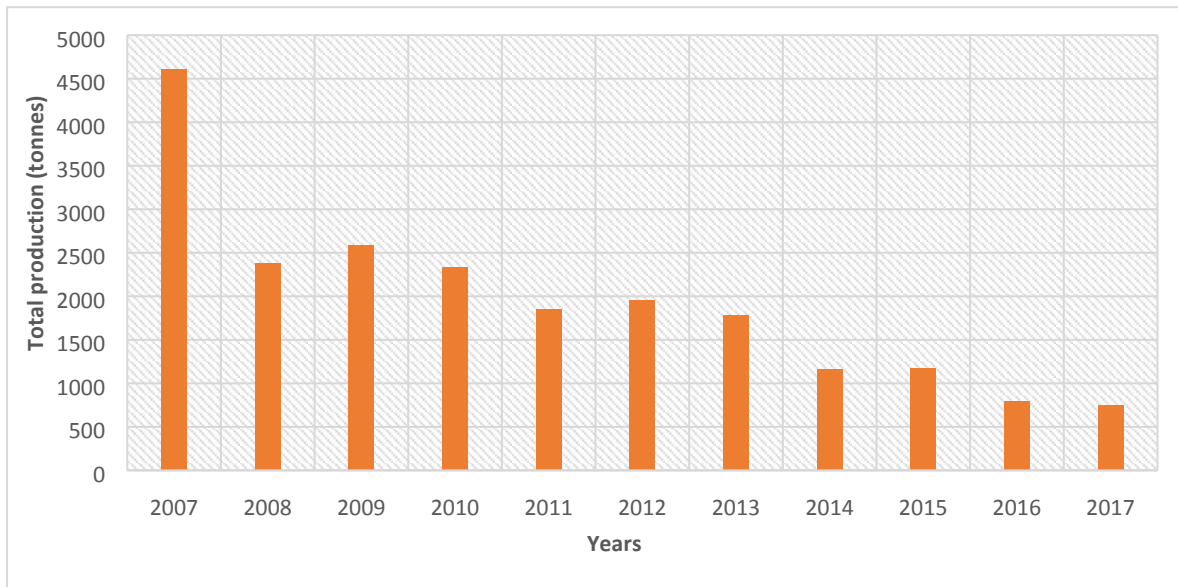
**Source:** Ministry of Trade and Industry, ITC Trade Map database and FAOSTAT (2020).



**Figure 2:** Annual import volumes of wheat by type from 2011 to 2018

**Source:** ITC Trade Map (2020)





**Figure 4:** Total annual production of wheat in Malawi from 2007 to 2017

**Data source:** FAOSTAT, 2020

**Table 1:** Average yield, area harvested and production of wheat in southern African countries (2014-2018)

Country	Yield (tonnes/ha)	Area harvested (ha)	Production (tonnes)
Zambia	6.6	26,376	176,688
Namibia	5.6	1,527	8,433
South Africa	3.4	492,407	1,700,600
Zimbabwe	2.0	19,219	37,517
Eswatini	1.8	397	715
Malawi	1.2	757	922
Mozambique	1.1	17,092	19,048

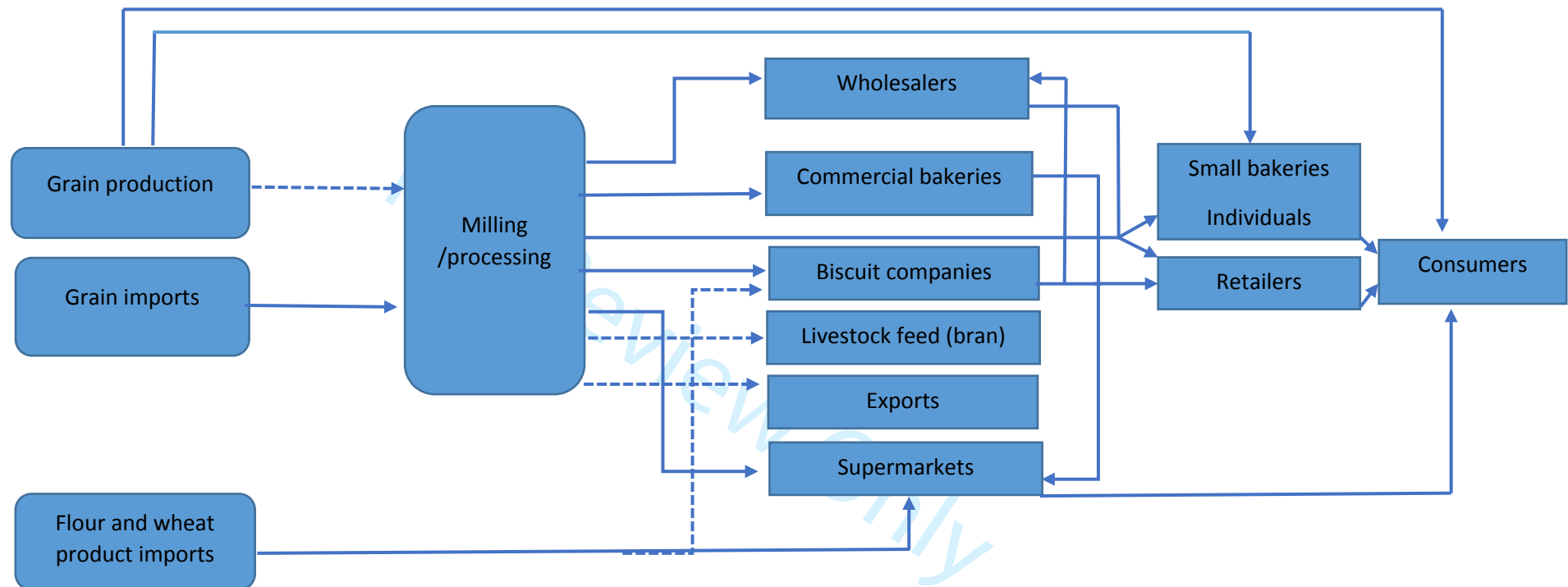
**Data source:** FAOSTAT, 2020





**Figure 5:** *Madonasi* (A, B), *kanyenya* and *mandazi* (C) made by women living in rural areas.

**Photo credit:** Veronica Guwela



**Figure 6:** Summary of the wheat value chain in Malawi. Note: dotted arrows represent channels that are not very active or cannot be accounted for due to lack of available data

**Table 2:** Total annual wheat exports from 2007 to 2015

Year	Quantity (tonnes)	Value (\$ '000)	Countries importing
2007	5786	436	South Africa, Japan
2008	5679	749	South Africa, Japan, Germany
2009	3809	272	South Africa, Zimbabwe, Japan
2010	7337	659	South Africa, Zimbabwe, Zambia
2011	11213	738	Zimbabwe, India, South Africa
2012	11213	738	Zimbabwe
2013	1515	311	Zimbabwe
2014	123	No data	Zimbabwe
2015	170	75	South Africa

**Source:** ITC Trade Map database, FAOSTAT (2020)

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**Table 3:** Total annual wheat bran exports from 2010 to 2018

Year	Quantity (tonnes)	Value (\$ '000)	Countries importing
2010	6990	No data	Zimbabwe, Zambia, Kenya,
2011	12986	No data	South Africa, Zimbabwe, Kenya
2012	14155	1560	South Africa, Zambia, Zimbabwe
2013	21248	3878	South Africa, , UAE, Switzerland
2014	23793	3149	South Africa, Zimbabwe, India
2015	30401	2886	Zimbabwe, Kenya, South Africa
2016	23789	2760	Zimbabwe, Botswana, South Africa
2017	22986	1383	Zimbabwe, Botswana, South Africa
2018	21030	1075	Zimbabwe, Botswana, South Africa

**Source:** ITC Trade Map database and FAOSTAT (2020)

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**Table 4:** Wheat consumption by products in 2010/11 and 2016/17

Wheat/wheat products	Count consumed		Mean of those consuming*			
	2010/11	2016/17	g/household/day		g/AME/day	
			2010/11	2016/17	2010/11	2016/17
Wheat flour	68	119	329	244	77	99
Bread	2079	2776	236	183	69	74
Buns, scones	2585	1747	120	80	34	32
Pasta	141	619	80	267	24	108
<i>Mandazi</i> , doughnuts	2801	4294	50	40	15	16
Breakfast cereal	35	141	123	110	36	37

\*This is the mean mass of the food item consumed, either at household level or per Adult Male Equivalent (AME), over the past seven days

**Source:** NSO, 2012; NSO, 2017

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**Table 5:** Total consumption by products and wealth quintiles in 2010/11 and 2016/17

Social economic position	Proportion of households consuming each food item, n (%)											
	Wheat flour		Bread		Buns, scones		Pasta		Mandazi		Breakfast cereals	
	2010/11	2016/17	2010/11	2016/17	2010/11	2016/17	2010/11	2016/17	2010/11	2016/17	2010/11	2016/17
Poorest	0	0	1	2	4	4	0	0	10	17	0	0
Poor	0	0	3	6	11	8	0	0	16	28	0	0
Middle	8	0	8	13	18	13	0	1	26	37	0	0
Wealthy	1	1	17	26	27	20	0	4	28	47	0	1
Wealthiest	1	4	42	65	35	26	4	19	28	44	1	4
Total	1	1	17	22	21	14	1	5	23	34	0	1

Source: NSO, 2012; NSO, 2017

**Table 6:** Wheat consumption by products and residency in 2010/11 and 2016/17

Residency	Proportion of households consuming each food item, n (%)											
	Wheat flour		Bread		Buns, scones		Pasta		Mandazi		Breakfast cereals	
	2010/ 11	2016/ 17	2010/ 11	2016/ 17	2010/ 11	2016/ 17	2010/ 11	2016/ 17	2010/ 11	2016/ 17	2010/ 11	2016/ 17
Urban	1	4	51	68	29	19	5	21	25	43	1	4
Rural	0	0	9	12	19	13	0	1	22	32	0	1

Source: NSO, 2012; NSO, 2017