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Horticulture, and wood and furniture industries in Tanzania

Performance, challenges and potential policy approaches

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Horticulture, and wood and furniture industries in Tanzania: Performance, challenges and potential policy approaches

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Abstract

This paper analyses two resource-based manufacturing industries in Tanzania: processing of horticultural goods and wood products and furniture. In several developing countries resource-based industrialization has worked as an engine of structural transformation. In Tanzania, these industries are still too small and inefficient. While industrial policy could help address the challenges that firms face in these industries, the country is currently lacking a concrete and detailed industrial strategy for these industries. In this regard, the cases of palm oil in Malaysia and wooden furniture in Vietnam teach important lessons. First, industrial targeting requires bundles of industrial policy instruments that reinforce each other. Second, science, technology, and innovation must be key priorities, even for industries that are not commonly considered "high-tech."

Keywords: resource-based industrialization; agro-processing; wood and furniture; structural transformation; industrial policy

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1 Introduction

With a per capita income of roughly $900, Tanzania has been listed as a least developed country since 1971. In the last decade, Tanzania grew at an average annual rate of 3.1%.[1] This is below the target of 8-10% set in several government plans, which is instrumental in sustaining a high long-run GDP per capita growth.[2] Slow economic growth has been accompanied by slow productivity growth and limited transformation of the production structure of the economy. Today agriculture and natural resources still play an important role in the economy, while traditional services are also growing. Industrial processing of agricultural products and other natural resources is uncommon in the country. As a matter of fact, and despite receiving considerable attention in policy documents, manufacturing is still to become that engine of economic growth that elsewhere transformed economies and countries into developed rich nations. As the literature on economic development has pointed out for decades now, all countries that developed into rich economies have done so by industrializing. In all these instances, manufacturing has provided more and better jobs than agriculture and services. It has created more linkages and spillovers throughout the economy, while enhancing productivity and triggering new innovations.[3]

Tanzania's prospects for sustained growth and socio-economic development crucially depend on its ability to generate more and better sources of income and employment. Under the right conditions, agriculture and natural resources can become engines of resource-based industrialization and kickstart structural transformation (Morris et al., 2012; Dinh et al., 2013; Jourdan, 2013; Marin et al., 2015; Page, 2015; Newfarmer et al., 2019). This paper focuses on two distinct industries: horticultural processing and wood and furniture. These were selected because they are part of the agro-processing industry and rely on natural resources and raw materials that are abundant in the country. Moreover, given the labour-intensive nature of these activities, they are among the industries that Tanzania could leverage to revive its manufacturing sector. At present, and as this paper shows, their potential is huge, but greatly untapped. With the right policy mix in place, other developing countries such as Malaysia and Vietnam became world leaders in these industries. In Africa, Ethiopia is making great strides in agriculture-led industrialization.

The objective of this paper is two-fold. First, it aims to provide a first overview of the evolution of Tanzania's horticulture and wood products and furniture industries, and, at the same time, of the current state of industrial policies designed to foster their development. Prior knowledge on the evolution of the two sectors is limited. The horticulture value chain has been studied in other East African countries, such as Kenya and Ethiopia.[4] The case of Tanzania has hardly received the same degree of attention. Case studies of the wood products and furniture value chain, whether at the

[1] This figure is obtained as the average GDP per capita annual growth rate for the period 2009-2018, based on constant 2010 prices (World Development Indicators, last accessed: 26/09/2018). It should be noted here that for the year 2017 the government of Tanzania estimated a growth rate of 7.1% (based on constant 2007 prices). For the same year, the World Bank's estimate in 2010 constant prices is 3.6%.

[2] See for example the Mini-tiger Plan and the National Five-Year Plan 2016/17 – 2020/21.

[3] For a review of this literature see for example Szirmai (2012).

[4] See, for instance, Zylberberg (2013) on the Kenyan cut flower industry, and Gebreeyesus and Iizuka (2012) and Oqubay (2015) on the case of Ethiopia.

regional or national level, are even scarcer.[5] Therefore the primary aim of this paper is to start filling this gap.

Our findings suggest that the Tanzanian government does not have a coherent strategy in place to support the growth of either industry. The policy currently in place falls short of specifying clear support measures for horticultural producers. Similarly, the Tanzanian government does not have any policy or strategy in place to foster the growth of a viable wood products and furniture industry. The support manufacturers receive is limited to few fiscal incentives and the establishment of special economic zones (SEZs).

These observations take us to the second objective of this paper, which is to shed light on the policies that supported the successful development of agro-processing activities in countries that were—and are—at a similar level of development relative to Tanzania. The cases of Malaysia, Vietnam, and Ethiopia all suggest that facilitating the growth of a modern agro-processing industry requires a comprehensive and sector-tailored industrial strategy that goes beyond scattered or *ad hoc* interventions. Such strategies are designed as bundles of different industrial policy instruments that tackle the various needs of firms in the sector.

This paper is structured as follows. Section 2 assesses of the status and potential role of the horticulture and wood and furniture industries in the industrial strategy of the country. Section 3 discusses the challenges to production and growth faced by the firms in the two sectors under scrutiny. The fourth section reviews the current industrial strategy of the country and identifies policy approaches that have worked elsewhere and therefore could serve as "role models" for Tanzania. Section 5 summarizes the findings of the paper and provides a number of policy recommendations.

2 The horticulture and wood and furniture industries in Tanzania

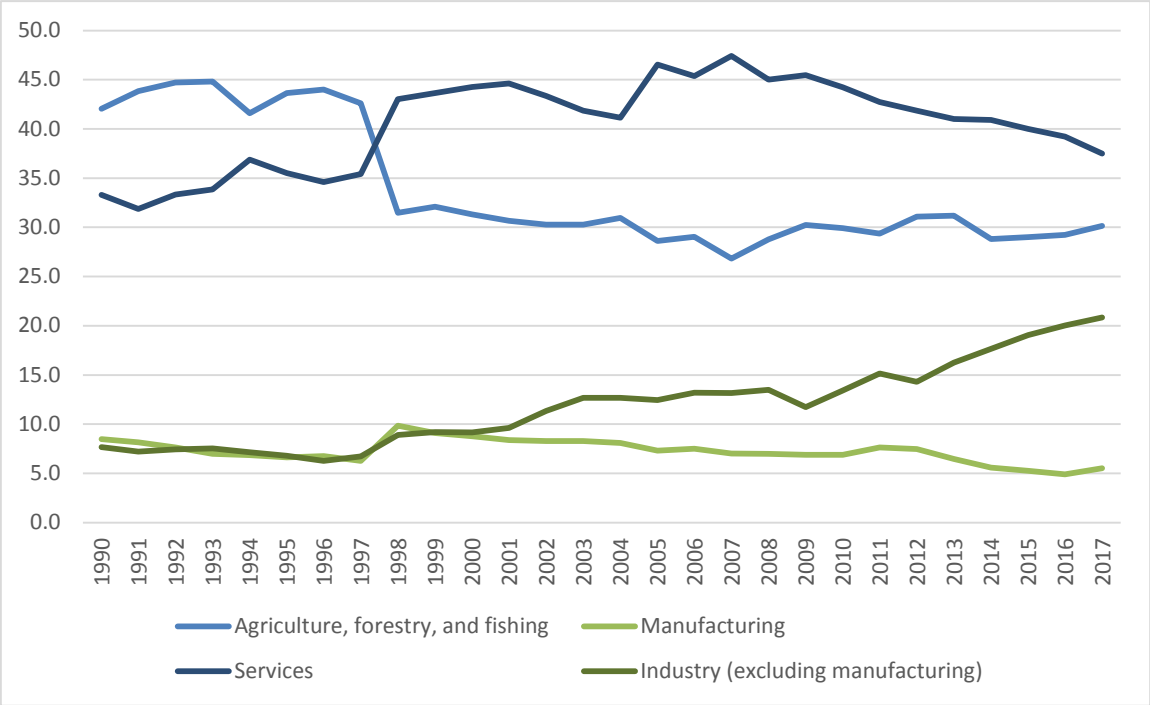
This section first gives a brief account of the structural change dynamics of the Tanzanian economy and then discusses the status and main characteristics of the two industries being examined. Given the specific interest of the paper in identifying activities to spur manufacturing growth, this paper looks at the processing segment of these two industries. The paper, however, also touches upon agricultural activities—respectively, the growing of horticultural produce, and forestry and logging activities—in order to provide a more complete picture of the opportunities and challenges of agricultural processing strategies. In the case of horticultural processing, the industries that process horticultural goods comprise processing and/or preserving of fruit and vegetables and production of wine (Annex 1). The wood and furniture industry comprise the following categories: sawmilling and planning of wood, veneer sheets and wood-based panels, builders' carpentry and joinery, wooden containers, other wood products, and furniture (Annex 2).

[5] Exceptions include Mhede (2012) on the case of wood furniture clusters in Tanzania and Kaplinsky et al. (2003) on the role of South Africa in the global wood furniture value chain.

2.1 Manufacturing, horticultural processing and wood and furniture: small but growing?

The Tanzanian economy today remains predominantly agrarian, with 66% of the workforce in agriculture and 30% of value added produced in this sector. As in many countries in the region, industrialization came to a halt at the end of the 1980s. Premature deindustrialization destroyed manufacturing jobs, moving workers into traditional services. Today, the services sector is the largest contributor to value added, with a share of 38% of GDP. While the share of industry has increased substantially since the early 2000s, manufacturing continues to play only a minor role, contributing to 6% of total value added (Figure 1).[6]

Figure 1. Value added shares in GDP, Tanzania, 1990 - 2017

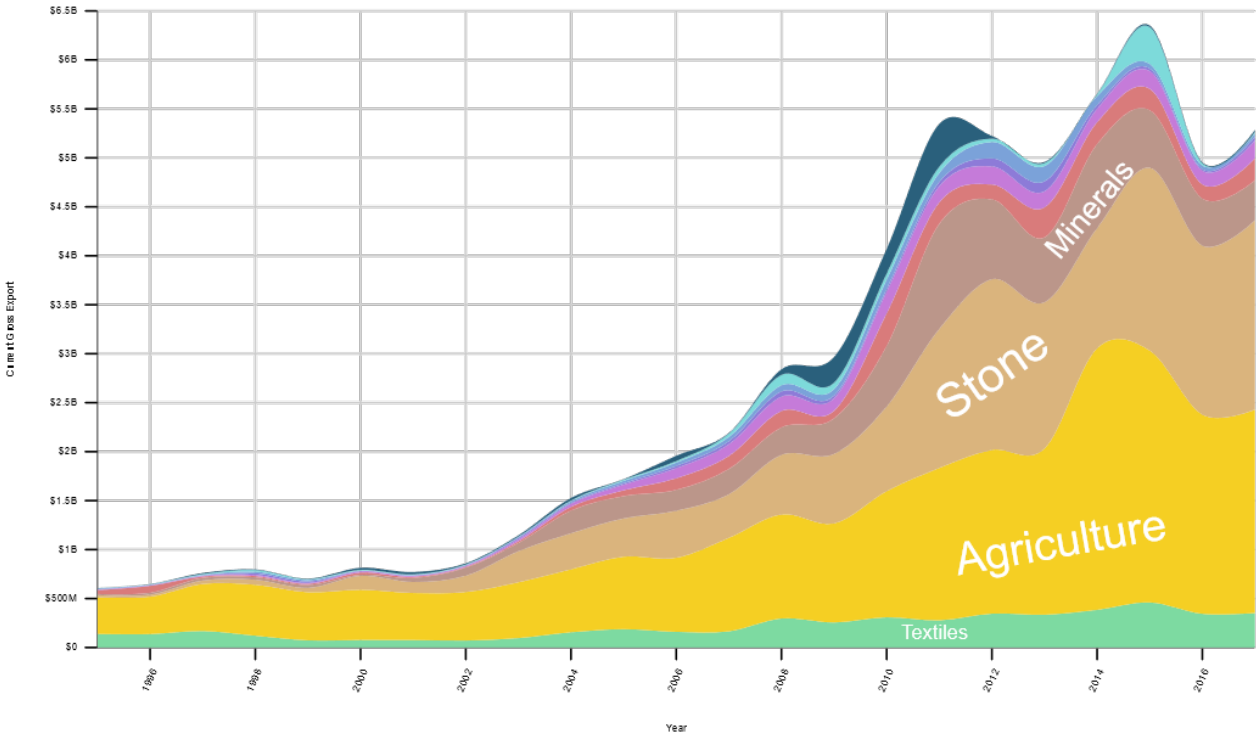


Source: Authors' elaboration based on World Development Indicators.

In the last decade, export growth rates have been rather erratic, with peaks of 26% in 2007 and 23% in 2015, and negative growth in 2016 and 2017. Not only have exports not grown fast enough, their composition has also changed little, and today simple commodities make up for a rather undiversified export basket (Figure 2 and 3).

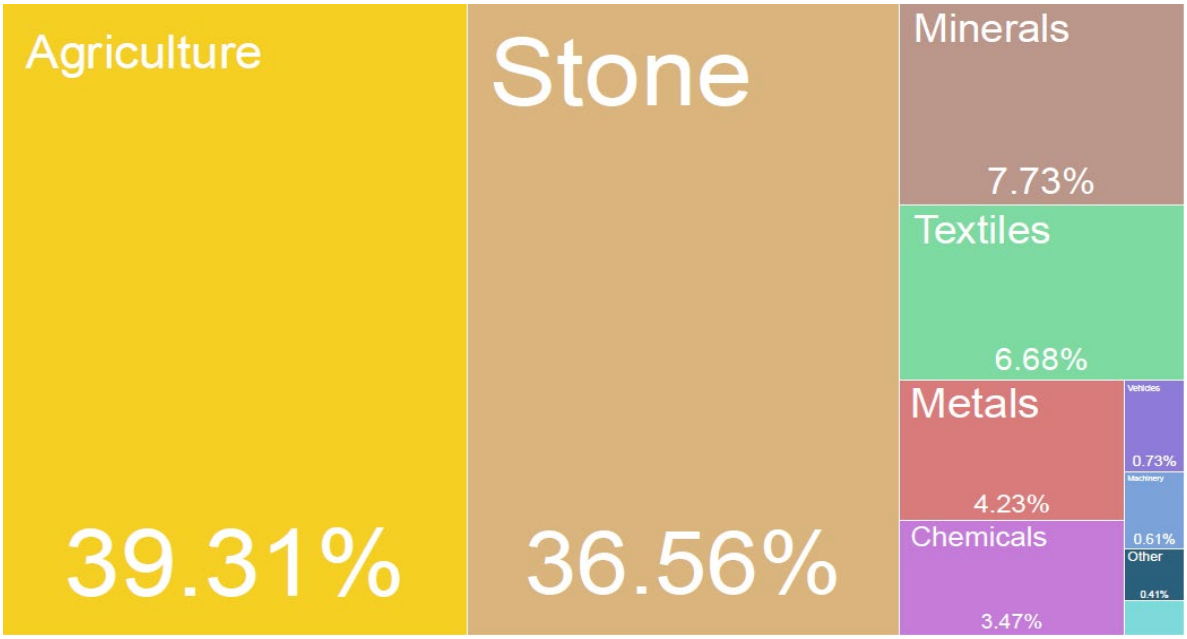
[6]In national accounts data, the aggregate "industry" comprises mining, manufacturing, construction, electricity, water, and gas. This corresponds to ISIC codes 10-45. In this figure, manufacturing is shown separately from "industry" in order to better understand its specific role.

Figure 2. Export growth, Tanzania, 1995 - 2017



Source: Atlas of complexity (Last accessed: 26/07/2019).
Notes: It excludes service exports.

Figure 3. Export composition, Tanzania, 2017



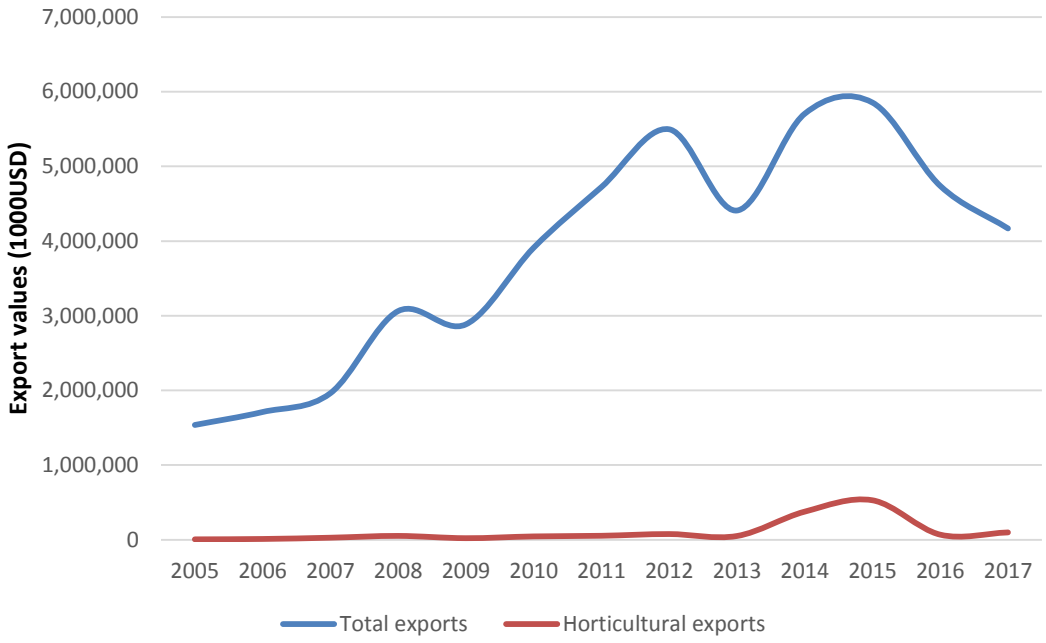
Source: Atlas of complexity (Last accessed: 26/07/2019).
Notes: The figure does not include service exports.

2.1.1 The status of horticultural processing: employment, value added, and exports

Horticultural processing activities are limited in Tanzania, representing 1.5% of manufacturing employment.[7] Despite the low base, since 2008, employment growth registered an almost 6-fold growth, with the industry expanding from 362 workers in 2008 to 2,021 in 2016. Most of this growth occurred in processing of fruits and vegetables, where employment grew almost 8 times and reached 1,265 workers in 2016. Albeit growing, the industry remains small in comparative terms. In Kenya, for example, processing of fruits and vegetables employed over 7,500 workers in 2015, or 2% of total manufacturing employment. Its value added was estimated at roughly $37 million in 2013, representing 1.3% of total manufacturing value added.[8]

While Tanzanian exports have grown considerably since the mid-2000s, agro-processing of horticultural goods does not seem to have significantly contributed to this growth (see Figure 4). Instead, exports of semi-processed and processed horticultural goods have remained almost constant since 2006, with only a small increase in 2014 and 2015 due to a spurt in the exports of palm oil (see also Box 3).

Figure 4. Horticultural exports and total exports from Tanzania to all trading partners, 2006-2017



Source: Authors' elaboration based on UN-COMTRADE (*Last accessed: 29/03/2019*).

Notes: The horticultural sector here refers to semi-processed and processed horticultural products. A list of the HS02 codes included here is available in Annex 1.

Products with an export value above $1 million for more than 5 years are: frozen and dried vegetables; other nuts[9]; dates, figs, pineapples, avocados and mangos teens; citrus fruits; palm oil;

[7] Based on IndStat Revision 4 data.
[8] *Idem*.
[9] Code HS2 0802.

sunflower-seed, safflower or cotton-seed oil; other fixed vegetable fats and oils; fruit, nuts, and other edible parts of plants; and fruit juices.[10] Most of these are also relevant when we consider the position of Tanzania in international markets, as Tanzania shows a revealed comparative advantage (RCA) in several of them (Table 1).[11]

Table 1. Agro-processing products with revealed comparative advantage (2014)

EXPORT CODE	DESCRIPTION	RCA (2014)
0710	Vegetables (uncooked), frozen	29.4
1511	Palm oil and its fractions	19.4
1515	Other fixed vegetable fats and oils	13.9
1512	Sunflower-seed, safflower or cotton-seed oil	12.8
0904	Pepper of the genus Piper	10.7
1508	Ground-nut oil and its fractions	6.9
0712	Dried vegetables, whole, cut, sliced, broken or in powder	5.2
2006	Vegetables, fruit, nuts, fruit-peel	2.4
1510	Other oils and their fractions, obtained solely from olives	1.4
2008	Fruit, nuts and other edible parts of plants	1.4
2009	Fruit juices (including grape must) and vegetable juices	1.3
2005	Other vegetables prepared or preserved	1.3

Source: Authors' elaboration based on UN-COMTRADE data.

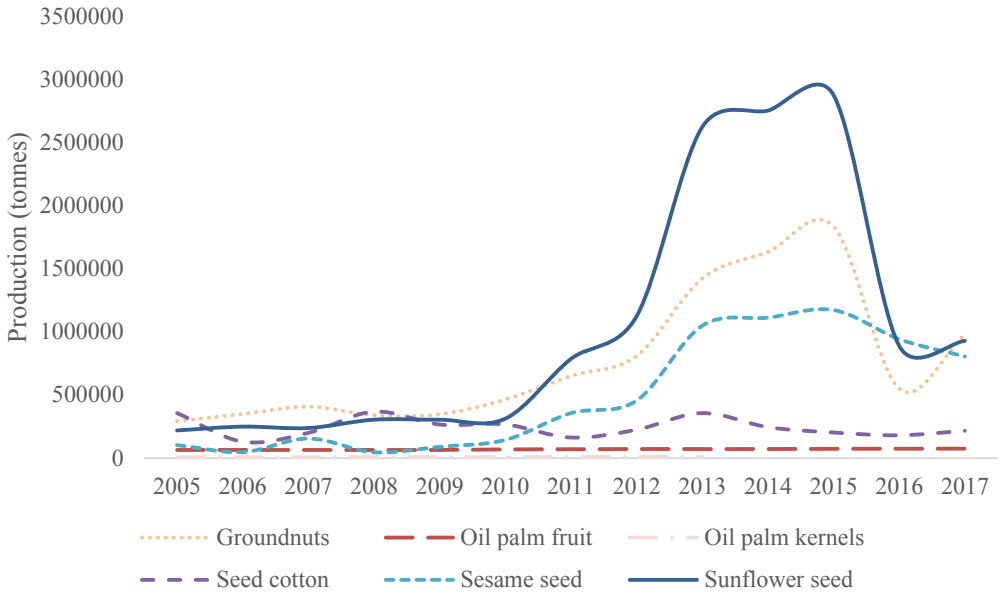
Box 1. The edible oil industry in Tanzania

Strengthening the domestic vegetable edible oil value chain has become a policy priority in Tanzania. Edible oilseeds grown and processed in Tanzania include sunflower seed, sesame seed, seed cotton, groundnuts, and oil palm fruit. The government's second FYDP (2016) stresses the need to reduce dependence on imports by increasing domestic edible oil production, both for local consumption and for export. According to the plan, domestic producers are to be supported by greater funding of public and private agronomical research; by increasing the availability and quality of seeds; and by providing financial incentives to growers and producers.

Partly as a result of policy targeting, production of edible oilseed crops has increased significantly in recent years (see Figure B1). This is particularly evident in the case of sunflower seed—a focal point for policy intervention in recent years—and, to a lesser extent, in the case of sesame seed and groundnut production. In contrast, and despite growing domestic demand, the production of palm oil fruit and kernels, which are grown in the Kigoma region, remains stagnant, also due to the small scale of local producers and their minimum use of scientific farming methods and technologies (UNIDO, 2019).

[10] Codes 0802, 0804, and 0805 include dried as well as fresh products, therefore the actual size of the export sector for semi-processed and processed horticultural products might be overestimated here.
[11] See Annex 3 for a definition of RCA.

Figure B1 – Edible oilseed production, 2005-2017



Source: FAOSTAT (last accessed 19/07/2019).
Note: Figures for 2016 and 2017 are FAO estimates and unofficial data.

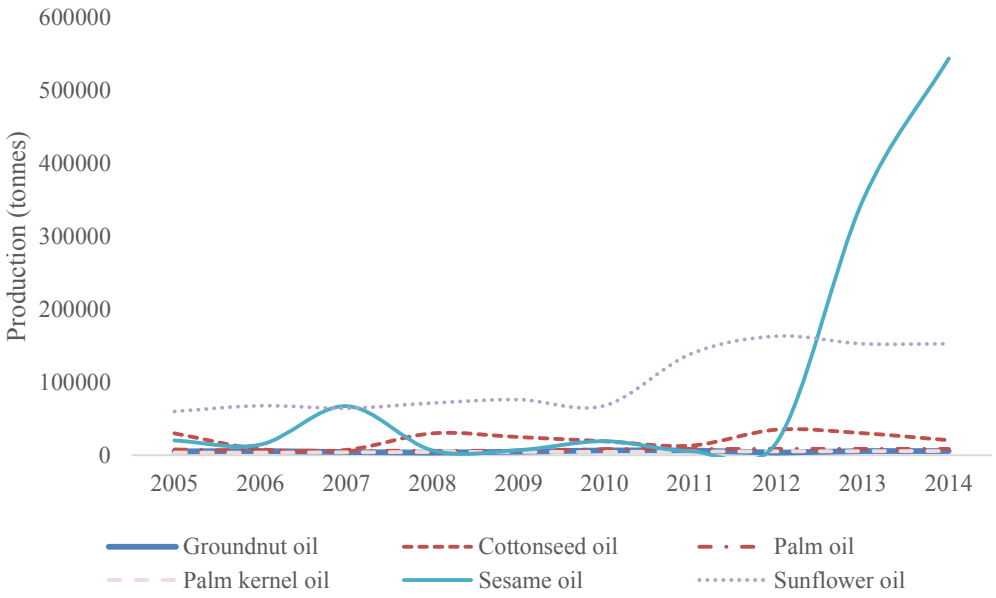
Throughout the oilseed sector, the availability of quality seeds remains a crucial limitation. Palm oil growers in the Kigoma area, for instance, predominantly employ a local variety of the Dura seed, which is extremely low-yielding (UNIDO, 2019).[12] Similarly, sunflower growers employ local seed varieties which, while more drought-resistant than new varieties, produce lower yields and can only be harvested after 120 – 150 days (compared with 75 – 90 days of new varieties) (Jahari and Kilama, 2018).

The lack of reliable irrigation infrastructure which is required by higher-yielding seeds, and the cost of improved seeds, are among the key barriers to improving agricultural productivity in the Tanzanian oilseed sector. Limited access to modern agricultural equipment compounds these issues.

While growth in oilseed production has recently been accompanied by the entry of small-scale crushing and refining plants that process oilseed in order to cater to the domestic market, Tanzania is yet to produce sufficient vegetable oil to satisfy the needs of local consumers, not to speak of consumers abroad (Jahari and Kilama, 2018). Processing is often done by farmers organised in local cooperatives using low-tech, traditional equipment. Available data suggests that, with the exception of sesame seed, the only case in which approximately half of crops that are grown locally are also processed in the country, oilseed processing remains extremely limited (see Figure B2). As a result, Tanzania remains a net importer of vegetable oils. Even sesame oil—the one crop where local processing has increased somewhat in recent years—is also not exported in significant quantities, suggesting that most production is aimed at the domestic market.

Figure B2 – Edible oils production, 2005-2014

[12] This problem is compounded by the absence of any oil palm seed suppliers in Tanzania, and in the whole of East Africa (UNIDO, 2019). See Section 4.4.2 for an overview of the Malaysian palm oil industry, where growers predominantly employ the high-yielding *Tenera* seed.



Source: FAOSTAT (last accessed 19/07/2019).

The picture emerging from these data suggests that the recent growth in oilseed production—and particularly in groundnut as well as sunflower and sesame seed—is yet to evolve into a dynamic agro-processing industry that can cater to domestic or foreign consumption. For instance, the erratic trend visible in sunflower seed production's data is not seen for sunflower oil, albeit the volume of production of the latter is significantly lower than the former. This evidence corroborates the findings that Tanzania does not process the raw materials produced locally. Consumers, particularly in urban centres, still rely on imported edible oil products. This is primarily due to Tanzania's limited domestic processing capabilities. As a result, domestic growers can either engage in small-scale processing for the informal market or, alternatively, sell their produce to traders and middle-men that export or re-sell unprocessed oilseeds with little value addition (Jahari and Kilama, 2018).

Source: Authors.

2.1.2 The status of the wood and furniture industry

In 2016, the wood and furniture industry employed roughly 8,000 workers, representing 6% of total manufacturing employment. Since 2008, the industry has grown 2.5 times in terms of employment. Its value added was estimated at $110 million, or 4% of total manufacturing value added. Labour productivity is also low, and lower than in furniture-making establishments in countries at a similar level of development, such as Vietnam (Global Development Solutions, 2011). As a result, average wages in the sector remain low, although, particularly in urban areas, they are reportedly above the estimated food and basic needs poverty lines (Mhede, 2012).

In comparative terms, the Tanzanian wood and furniture industry has great growth potential. In Vietnam, the same industry employed roughly 500,000 workers in 2016, producing over $3 billion in value added.

Exports of wood products and furniture are negligible in Tanzania, whose trade balance in these product categories has been in deficit for over a decade according to UN COMTRADE data.[13] Goods with export earnings above $1 million are wood marquetry and inlaid wood, and other furniture and parts thereof.[14] Tanzania also used to export logs, but the government has banned logs export since 2006, in a failed attempt to stimulate local processing of wood. The largest part of the Tanzanian production in this sector goes therefore to domestic consumption.

2.2 Similarities and differences between these two industries

There are similarities between these two industries. Both consist of labour-intensive activities, entailing processing of agricultural resources. Both industries are dualistic - while a niche of high-productivity firms operates with modern technologies and production techniques, the rest of the industry is constituted by informal firms which employ rudimentary technologies and production techniques. Such duality is very common in developing countries and reflects a developmental stage in which there is a small selected group of highly productive firms that are in the same environment as small, unproductive and often informal firms. This creates a double challenge for industrial policy: increasing productivity and fostering technological upgrading while also reducing productivity differences between firms.

Moreover, firms in both industries operate in fragmented value chains. Agro-processing firms and wood and furniture makers source primary inputs from a variety of domestic sources, ranging from smallholder farmers to commercial plantations. Small yield and low-quality produce deriving from the upstream section of the value chain constitute an important challenge to the further development of the two industries. Other critical inputs for producers, such as machinery and packaging materials, are sourced from intermediary firms who import them from abroad.

Despite these similarities, differences between the two industries exist too. Notably, producers differ in their export orientation. Some firms that process horticultural produce have managed to successfully reach regional and global export markets. By contrast, wood and furniture producers predominantly supply the domestic economy, by selling to retailers and final consumers.

2.3 Organizational features of the two value chains

2.3.1 Processing of horticultural goods

Horticultural crop production in Tanzania can be divided into two sub-sectors: the cultivation and processing of fresh vegetables, fruits, nuts and spices; and floriculture. Floriculture does not require processing and therefore falls outside the scope of this study. The horticulture value chain encompasses both agricultural and manufacturing (or processing) activities. While the latter constitutes the focus of this paper, it is worth noting that processing activities reportedly remain limited in Tanzania and the majority of horticultural produce is marketed without processing (Match Maker Associates, 2017).

[13] Only in partly processed sawn hardwood (mainly teak), Tanzania is a net exporter (Held et al., 2017).
[14] These correspond to export codes 4420 and 9403, respectively.

Figure 5 below provides an overview of Tanzania's horticultural value chain. The horticultural value chain is heterogeneous with regards to both ownership patterns and average firm size. Upstream activities—fresh fruit and vegetable production—are dominated by individual farmers and small growers, with farm size averaging at less than 2 hectares (HODECT, 2010). Small farms reportedly account for around 70% of producers. Cultivation and marketing occur through contract arrangements that involve farmers' cooperatives, sometimes set up with the support of foreign aid (Cooksey, 2011).[15] The fruit and vegetable sub-sector is estimated to have fewer than 40 large-scale growers who also export, a majority of which are located in the northern region around Arusha and Moshi. Estimates suggest that less than 10% of fruit and vegetable produced in Tanzania is exported. The majority of production is consumed domestically, and a small portion of it is processed (Match Maker Associates, 2017).

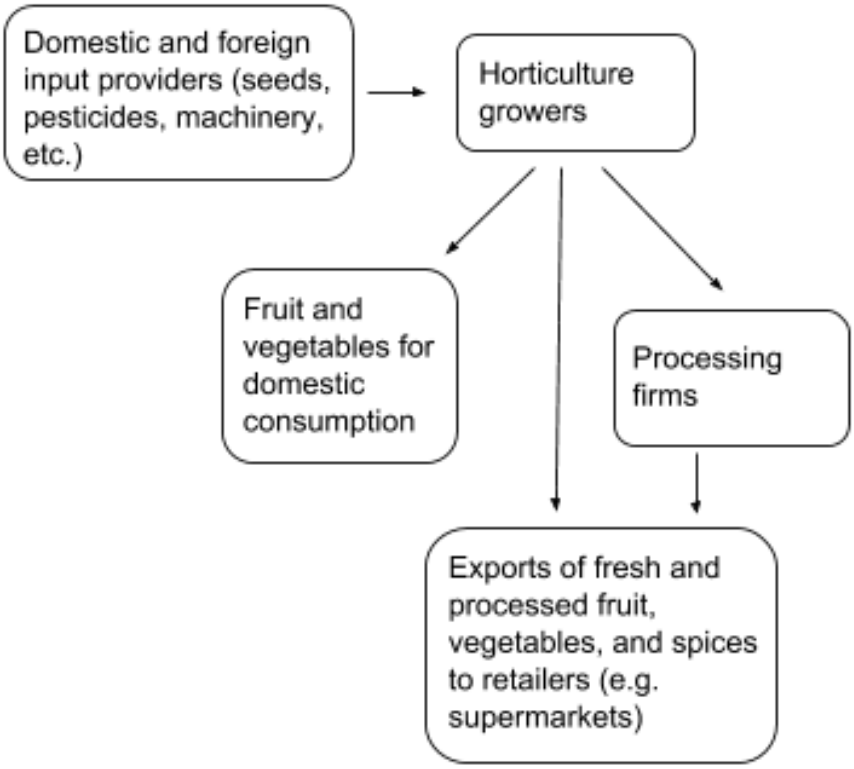
Farming predominantly consists of rain-fed agriculture, as access to irrigation is limited. Due to lack of finance and, in some instances, lack of awareness regarding the availability of extension services, small-holder farmers also struggle to access critical agricultural inputs such as pesticides, fertilizers and new varieties of seeds (Dube et al., 2018; Jahari et al., 2018). Agricultural inputs, including farm equipment and agricultural machinery, are generally imported from abroad and supplied to farmers by intermediary firms. These specialized suppliers are located in rural areas, close to horticultural farmers (Match Maker Associates, 2017).

The vast majority of farmers sell their produce through intermediate buyers, who then sell to local markets, export markets, or processing companies. Due to the limited domestic processing capabilities for certain agricultural and horticultural crops, fresh produce can be exported to neighbouring Kenya, where it is processed and then re-imported back in Tanzania. This is the case, for instance, with oranges, which are exported fresh to Kenya and subsequently re-imported in the form of bottled orange juice (Dube et al., 2018). Some processing, however, is also carried out by groups of farmers (Dube et al., 2018). Domestic processing of horticultural produce includes the manufacture of fruit juices, dried fruit, canned vegetables and fruit, vegetable- and fruit-based condiments and sauces such as jam and chutney. Generally, however, the processing of fruit is considered a residual business that depends on downgraded fruit that is not suitable for the fresh market (Dube et al., 2018). Part of the processing of fruits and vegetables is carried out by small-scale, informal processing firms which employ rudimentary equipment and techniques.[16]

[15] Donor support for horticultural development in Tanzania include funding from the government of the Netherlands to establish the TAHA and a United States Agency for International Development (USAID) capacity building programme for small horticulture growers. The Dutch government also financed a five-year project, the Tanzania Agriculture Productivity Programme, which included horticulture growers (Cooksey, 2011).

[16] According to fieldwork results (see Section 3), the farmers who are most likely to carry out processing activities are either involved with a cooperative (see above) or are owners/managers of larger commercial activities. Limitations in primary and secondary data make it difficult to further characterise these two group. According to few existing studies and the results of our fieldwork, farmers seem to prefer the sale of fresh produce (particularly if for export), as it usually commands higher prices.

Figure 5. The Tanzanian horticulture value chain



Source: Authors' elaboration.

Horticultural exporters are increasingly integrated in regional and global value chains. Approximately 70% of fresh and processed fruit is destined to regional markets within the East African Community (EAC) and the Southern African Development Community (SADC). The remainder reaches higher-value markets in Europe (Dube et al., 2018). Exports to Europe typically occur through direct sales to retailers. Buyer-driven chains are closely coordinated by large retailers, who set specific product and process standards producers have to abide to (Ponte and Gibbon, 2005). Since direct sales depend on the ability to comply with quality standards dictated by the buyers, supporting producers' adherence to standards is likely to become an increasingly important policy priority.

The sector benefits from the lobbying activities of the Tanzania Horticulture Association (TAHA). TAHA, a private sector, member-based organization, was established in 2004 with support from the Dutch government. It lobbies for the implementation of policies favourable to horticultural farmers, and also provides technical training on good agricultural practices (GAPs). Over the years, TAHA has spearheaded a number of policy initiatives. For instance, the association was instrumental in ensuring the government did not pass an increase in the value added tax on air freight exports as part of the 2009 budget (Cooksey, 2011). The majority of its members are located in the Arusha-Moshi area, following the trend of horticultural producers which are generally based in these regions.

Another group of actors active in this sector is constituted by research institutes, such as the Selian Agricultural Research Institute, the Mikocheni Research Institute and the Horticultural Tengeru Institute. Research institutes support horticultural producers with research-related services, extension services, and in complying with international standards (Match Maker Associates, 2017).

2.3.2 Wood products and furniture

Wood and furniture production is one of Tanzania's oldest industries, with the first sawmills being established in the late 1950s and early 1960s (Sutton and Olomi, 2012). Furniture companies were nationalized in the 1960s and later, during the privatization wave of the 1990s, returned to the private sector (see Section 3.1 below for an overview of Tanzania's industrial policy since independence). Liberalization facilitated the entry of furniture importers in the country. In recent years, the distinction between local manufacturers and importers has become blurred, with some importers having started to manufacture locally and some sawmills importing furniture to complement what they themselves produce (Sutton and Olomi, 2012). Today, the main product categories of this industry are wood and metal household and office furniture; garden furniture made from tropical hardwoods; and handmade, general furniture made by hand from tropical hardwoods (Sutton and Olomi, 2012).

Except for some relatively large firms which import and manufacture furniture for the domestic market, the majority of wood products and furniture producers are small and medium-sized enterprises (SMEs) located in clusters, such as the Keko and Buguruni-Malapa clusters in Dar es Salaam. Firms in clusters are predominantly informal micro-enterprises and SMEs working with a small number of regular employees and employing dated technology and hand tools (Mhede, 2012).[17] Their scale and low technological profile severely hinder their ability to increase production scope and improve quality, thereby hindering their opportunities to upgrade in global and regional value chains. Approximately 90% of firms in the sector are locally owned and predominantly supply the domestic market, with domestic sales estimated at over 95% of total sales (Mhede, 2012).

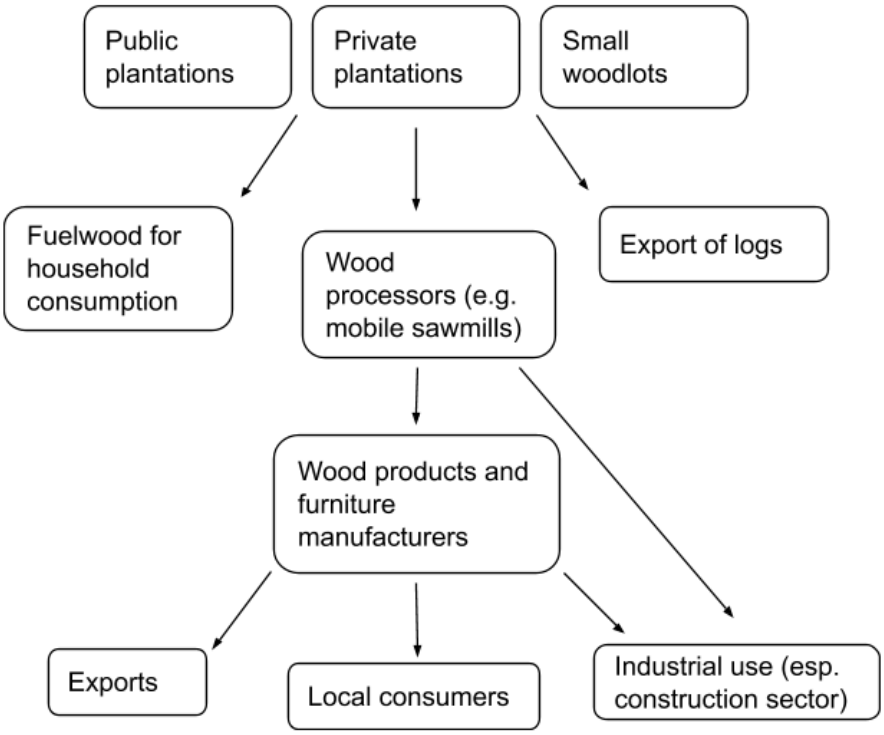
Figure 3 below provides an overview of the wood and wood products value chain in Tanzania. The most upstream product of the value chain is wood. Over half of the wood plantations in Tanzania are owned by small and medium scale tree growers that use lower quality seeds and do not employ best practice silviculture. The remainder is constituted of large private plantations—estimated at 15% of total forest hectares—, public plantations (approximately 30% of the total) (Held et al., 2017) and informal lumberjacks who cut natural trees for timber, sometimes illegally, to sell to the furniture industry. Timber, which provides the main input for the wood and furniture industry includes timber from hardwood—such as eucalyptus, teak and black wattle—and softwood, such as pine.

[17] Mhede (2012) reports that, in his survey of 117 cluster-based furniture firms located in the Dar es Salaam municipality, only approximately 30% were found to be legally registered. The share of informal firms is likely to be higher in rural areas. Reports also suggests that some firms in the sector employ equipment from the 1930s and 1940s (Global Development Solutions, 2011).

Plantations and other woodlots supply logs to wood processors and to traders, who may sell on the domestic market or export unprocessed logs. Logging activities are small-scale and carried out with old technology, resulting in low harvesting recovery rates (Dinh et al., 2013).[18] The wood products and furniture industry is a relatively minor consumer of processed domestic wood. While the bulk of wood consumption is generally devoted to household fuel wood use, the industrial consumption of processed wood is dominated by the construction industry (Global Development Solutions, 2011; Held et al., 2017).

Wood processors that supply timber to the construction sector and to wood and furniture manufacturing firms are, for the most part, small entrepreneurs employing mobile sawmills with low recovery rates and producing low quality timber. With dispersed and small woodlots, mobile millers are currently the only actors able to process wood profitably and are therefore a key outlet for small tree growers (Held et al., 2017). The poor quality and limited supply of domestic timber, which contributes to make Tanzania a net importer of semi-processed wood, is recognised as an important bottleneck for the further development of the wood and furniture industry (Global Development Solutions, 2011).

Figure 6. The Tanzanian wood and furniture industry



Source: Authors' elaboration.

[18] Recovery rates in harvesting average between 20% and 35%, meaning that between 65% and 80% of wood is left in the forest (Dinh et al., 2013).

Wood products and furniture makers are not currently represented by any sectoral business association similar to TAHA, limiting the scope for lobbying efforts with the government. Moreover, compared to the horticultural sector, this industry is not benefiting from the presence of any specialized research institute.

2.4 Characterising Tanzanian firms in the two industries

This section uses data from the Census of Industrial Production (CIP) 2013 collected by the National Bureau of Statistics of Tanzania (NBS) to provide a snapshot of the two industries. It describes the firms that compose these two industries, thereby highlighting their main commonalities and differences (see Table 2).

Many more firms are engaged in wood and furniture (3,501) than in processing of horticultural goods (120). Among the former, furniture firms are the majority; among the latter, most of the firms are engaged in processing and preserving of fruits and vegetables.

Most of these firms are domestically owned private firms. They are generally very small, with the average number of workers ranging from 14 in horticultural processing to 5 in wood and furniture. In both industries, a rather skewed industrial structure is evident, with a couple of large firms and many small and very small firms (see Figure 5 and Figure 6). In horticultural goods' processing, half have 3 employees or less; only 3 have between 100 and 200 employees and only one firm has over 300 employees. The same applies to the wood and furniture industry, where over 70% of the firms have less than 5 employees. Only a few firms are large, with one of them employing more than 1,000 workers. Indeed, the size of the business is the most frequent reported reason for informality, followed by financial constraints.

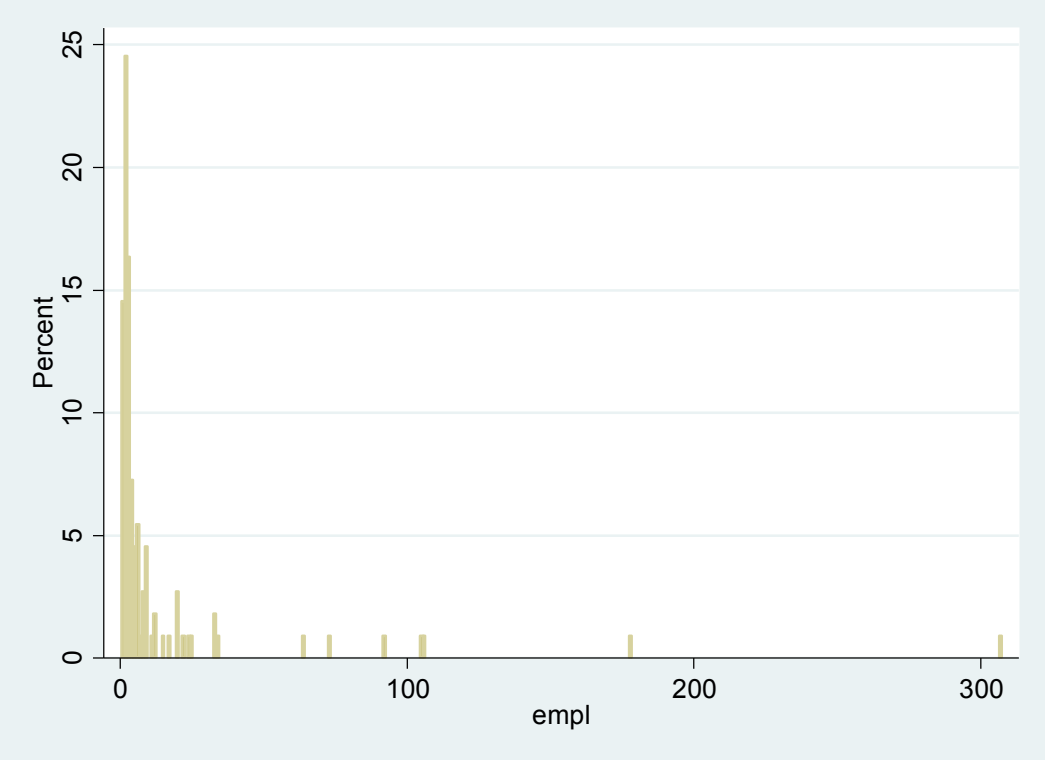
Few firms have received support from the government during commencement of their business activities. While few firms reported on the matter, the majority do not seem to present severe capacity underutilization. When capacity underutilization is an issue, 55% of all respondents report insufficient power supply as its main cause. The main challenge to doing business, as reported by firms in both industries, is the high cost of production.

Table 2. Main characteristics of the firms in these two industries

	Horticultural processing	Wood and furniture
Number of firms	120	3,501
Ownership	Private domestic firms	Private domestic firms
Year of establishment (average)	2007	2002
Size of the firms	Small	Small
Average n. Employees	14	5
Range n. Employees	1-307	1-1174
Share of informal firms	59%	73%
Firms that received government support	1 firm	20 firms
Capacity utilization	60-80%[19]	50-70%[20]
Most severe challenges	High cost of production	High cost of production

Source: Authors' elaboration based on Census of Industrial Production (CIP) 2013.

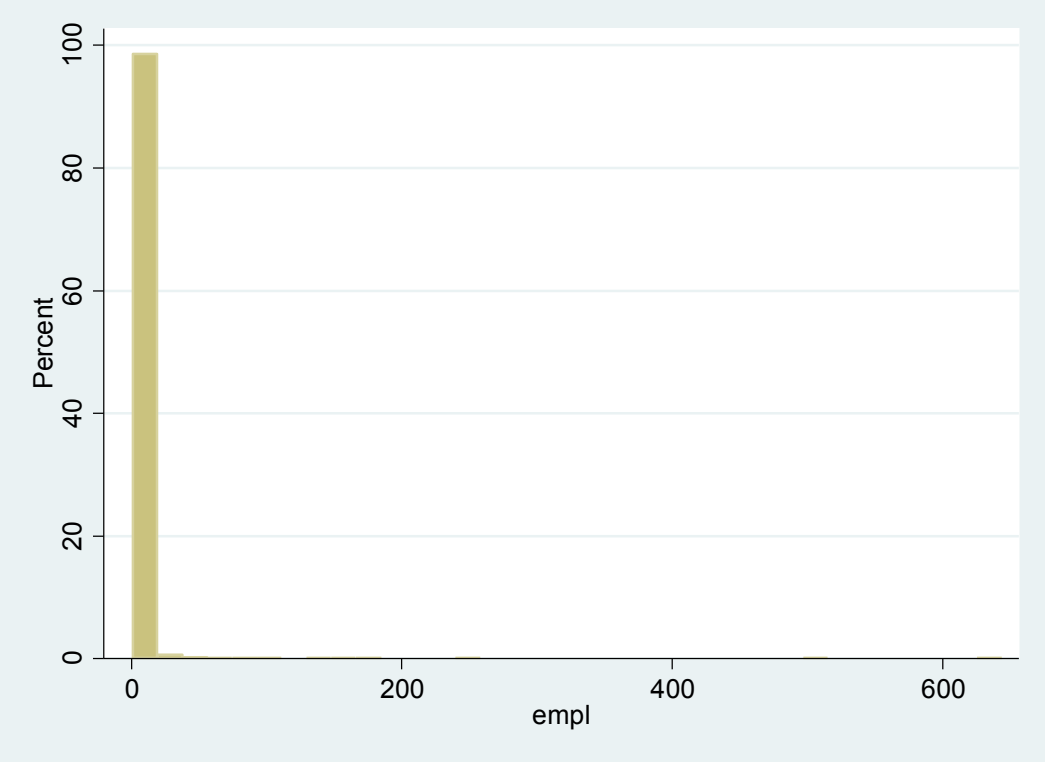
Figure 7. Employment in horticultural processing firms, Tanzania (2013)



Source: Authors' elaboration based on the Census of Industrial Production (2013).

[19] Please note that only 33 firms replied to this question.
[20] Please note that only 182 firms replied to this question.

Figure 8. Employment in wood and furniture firms, Tanzania (2013)



Source: Authors' elaboration based on the Census of Industrial Production (2013).

Consistently with their profile, these firms do not generally export and when they do, inadequate supply capacity is listed as the single most important barrier to export expansion. They operate manual or semi-automatic machineries. In 56% of the cases this machinery is imported. Based on the data collected in the Census of Industrial Production (2013), most of these firms are not preoccupied with the quality standards of their products and over 95% of them have not certified any of their products. Among them, only 3 in 10 firms control the quality of the raw materials purchased; very few have marketing strategies. In this regard, another factor often listed as an impediment to export growth is low product quality, mainly due to poor technology and production practices employed.

3 Challenges of the industrial policy framework for the horticultural and wood and furniture industries

This section draws from secondary literature and from a short fieldwork conducted in Tanzania between May and June 2019. We interviewed a total of 22 firms, 14 in the horticultural sector and 8 in the wood and furniture sector. Interviewees in the horticulture sector were located in the Arusha and Kilimanjaro regions, whereas wood and furniture firms were based in Dar es Salaam and Arusha region.

3.1.1 Horticulture

The development of a viable commercial horticulture industry is currently hampered by several challenges. Among the most widely cited by stakeholders are infrastructural and technological bottlenecks, which significantly increase production and logistics costs for local firms, and an unpredictable regulatory and fiscal framework, which generates uncertainty for investors. Limited access to credit and under-developed intra-industry linkages, particularly in the supply of agricultural inputs and industrial machinery for processing, compound these problems.

Infrastructure is widely regarded as one of the main challenges to the further development of Tanzania's horticulture sector. A poorly developed road infrastructure raises transport costs, hampering producers—often located in the northern regions of Arusha and Kilimanjaro—from reaching urban consumers. This is exacerbated by the lack of an adequate rail infrastructure for cargo transport in almost all routes within the country, which is often a cheaper mode of hauling cargo when compared to road transport. Access to foreign markets is further complicated by the limited air-freight capacity at Tanzania's airports, and by shipping costs, reportedly higher relative to other airports in the region (see Box 2 for a brief overview of the case of Ethiopia).[21] As a result, most of the fresh as well as processed exports are dispatched to foreign markets through the Jomo Kenyatta International Airport in Nairobi, Kenya (Riisgaard, 2009). Limited access to a reliable electricity supply compounds infrastructural issues. All of the firms that were interviewed reported high costs for electricity use and frequent power outages.

The design and current implementation of the tax system is reported as another key challenge faced by horticultural producers. One concern is that exemptions from VAT and import duties that are, in principle, granted by the Ministry of Finance and Planning through the Tanzania Investment Centre (TIC), are often not honoured by government agencies. The TIC is also responsible for a package of incentives to horticulture investors, including tax breaks on investment capital, and rights to employ foreign managers and repatriate profits. Yet, duty exemptions are reportedly not honoured by Customs offices (TAHA, 2012). Similarly, several of the interviewed firms have expressed their concern that tax rebates are often not respected by the Tanzanian Revenue Authority (TRA). Moreover, it is believed that tax and import duty incentives are implemented poorly, with imported inputs, which should be duty free, often held up at the border, thus hampering production and raising costs (Cooksey, 2011).

Regarding the regulatory environment of Tanzania, limited capacity seems to remain as to the application of standards and the certification of firms and products, an increasingly important element for a viable food processing industry. Compliance with standards can be costly: ensuring initial compliance before production of a food grade product has been estimated at an approximate cost of $990 (UNIDO, 2019). In certain segments of the industry, such as palm oil production (see Box 1), there is little support from the Tanzanian Bureau of Standards (TBS) and the Food and

[21] According to stakeholders, shipping is costlier in Dar es Salaam and Kilimanjaro airports than in Kenya because of Swissport enjoying a monopoly over freight handling; and because of fuel taxes—higher in Tanzania than in Kenya (TAHA, 2012).

Drug Authority (TFDA) in the certification of domestic produce (UNIDO, 2019). Greater efforts are needed to decrease the costs of compliance, especially for SMEs.

A related set of challenges emerges with regards to other government regulations. Health and safety regulations covering the use of pesticides, as well as fire and health hazards, tend to change frequently, creating uncertainty for producers and investors. Moreover, the processing of work permit applications reportedly requires lengthy bureaucratic procedures. This makes it difficult for entrepreneurs and managers to hire skilled workers from abroad, which are scarce in Tanzania.

Tanzanian producers are also at a disadvantage relative to producers in other developing countries due to the relative backwardness of the country's agricultural technological status. The vast majority of Tanzanian growers produce at a very small scale and with poor soil preparation.[22] Irrigation methods are also under-developed, with most farmers depending on rain-fed agriculture rather than more reliable water sources such as boreholes. As a result, agricultural productivity is lower than in competing countries. According to the information collected in our fieldwork, Tanzanian farmers produce an average of 6-7 tons of maize per hectare whereas growers in competitor countries, such as Zimbabwe and South Africa, reach average levels of 10-11 tons of output per hectare.

Under-developed linkages with suppliers of agricultural inputs and supporting organizations also reduce productivity. Horticulture farms typically require strong linkages with nurseries, pack houses, cold storage facilities, as well as with organisations providing training and extension services (HODECT, 2010). Currently, most nurseries in Tanzania are not certified. Cold storage facilities at key distribution points are either too small, such as at Julius Nyerere International Airport in Dar es Salaam, or entirely absent. Moreover, despite demand for specific expertise in areas such as pest management and post-harvest management, training opportunities for farmers and farm managers are still lacking (HODECT, 2010).

Finally, access to credit, particularly long-term loans, can represent a challenge for horticulture businesses. The commercial banks that finance horticulture activities are few and tend to impose high collateral requirements as well as relatively high interest rates. Government- and donor-led programmes are regarded by horticulture farmers as being, respectively, under-funded, and focused on capacity-building activities rather than on investment finance (HODECT, 2010).

Another challenge identified in previous research is related to uncertainty over rights to access land and water resources. Land and water rights represent a contentious issue in Tanzania, where, as reaffirmed with the 1999 Land Act, all land belongs to the state which can then lease it out to businesses (see, for instance, Boone, 2015). Leases over state land are not always considered secure. Indeed, Tanzania's land and water access rights regime has experienced numerous changes over the past years, resulting, at times, in open conflict. Resolving conflicts over property rights is further complicated by Tanzania's poor land surveys, title registration systems, and judicial

[22] According to our fieldwork, growers reportedly employ at most 15 centimetres of soft soil, as opposed to an average of 40 centimetres of soft soil in countries such as Zambia and Zimbabwe.

performance at all levels. While investors currently enjoy relatively secure property rights over land and water, these are not formally guaranteed (Cooksey, 2011).

3.1.2 Wood products and furniture

In the wood products and furniture industry, the challenges identified by observers and stakeholders are mainly related to the outdated and rudimentary technology employed in production, together with the very small scale of production of firms. These two factors contribute to account for the low labour productivity relative to regional and world market leaders. Poor access to electricity from the main utility grid, leading to frequent outages, and limited access to credit, compound these problems (Global Development Solutions, 2011).

According to our fieldwork, the vast majority of furniture processing activities are still done by hand. Industrial machinery is often outdated and not frequently used in production. Firms have also expressed concerns about the availability of skilled labour which, according to some of the interviewees, is exacerbated by the limited effectiveness of institutions providing technical and vocational training to workers, such as Vocational Education and Training Authority (VETA). Firms have observed a decline in the number and quality of the country's technical institutes. Access to finance is another challenge that firms in the sector regard as critical in preventing the expansion of their operations. Commercial banks are generally perceived as being excessively bureaucratic. Moreover, firms tend to struggle to meet banks' demands for collateral and perceive loans as being too costly to obtain.

Another challenge is located upstream in the value chain - in the forestry and wood processing industry. Here, the provision of low-quality timber affects the competitive production of locally manufactured wooden articles and furniture, leading Tanzania to remain a net importer of wood and wood products (Held et al., 2017). Moreover, accessing local timber is made challenging by a high tax burden, as wood products and furniture makers face a forestry levy, a levy imposed by the Ministry of Natural Resources, as well as levies at the village and district council level. As a result, wood products and furniture producers in the Keko furniture hub reportedly import over three-quarters of their wood from Mozambique and the Democratic Republic of Congo, despite Tanzania having a huge potential as a source of wood and timber.

4 Industrial policies in Tanzania and potential role models for the two industries

The practice of industrial policy in Tanzania since independence has been characterized by shifts in the relative roles of the state and the private sector. As other countries in the region and in the rest of the world, during the 1960s and 1970s, Tanzania's efforts to industrialise were guided by a strategy of import-substitution (ISI). As in many other developing countries, import substitution achieved some important results, but also created several inefficiencies. These opened the way to a totally different approach to industrial policy, which prioritised privatizations and liberalizations, encouraging foreign investment and opening the economy to global competition. Following the Washington Consensus and the economic recipes in fashion at the time, the Tanzanian economy underwent major transformations. Today, and like many other developing countries, the country is

experimenting with a modern way of conceiving industrial policy, trying to strike a balance between horizontal and vertical policies.

This section briefly reviews the industrial policy approaches adopted by the country since independence and analyses its current industrial strategy in relation to the role and potential of the two industries under scrutiny. It also reviews the case of Malaysia and Vietnam, which managed to become important players in these industries thanks to a good mix of industrial policy tools.

4.1 Past industrial policy in Tanzania: A brief overview

The historical experience of Tanzania with industrial policy can be broadly divided in three periods: the import-substitution period, the "Washington Consensus" period, and the current policy initiatives, which cover the period from the early 2000s.

4.1.1 From independence to socialism: import-substitution industrialization

The early 1960s were a period of relatively rapid manufacturing growth, guided by the First Three-Year Development Plan (FYP) (1961-63). The FYP aimed at promoting the local production of substitutes for imported products, by introducing subsidies as well as tariffs on manufactured imports. Criticism over the distributive effects of this policy, and its failure in promoting local entrepreneurship contributed to its revision. With the Arusha Declaration of 1967, the industrial strategy of the country called for a more active role for the state. Nationalizations of foreign-owned enterprises followed suit, along with an expansion of public enterprises (Msami and Wangwe, 2016).[23] A system of industrial licenses, subsidies, preferential access to credit through state-owned commercial banks, import tariffs, and exchange rate manipulation constituted the policy mix of that time.[24]

While in the 1967 - 1973 period ISI delivered rapid manufacturing growth, by the mid-1970s growth started faltering and ISI started to raise concerns. Parastatal enterprises were receiving credit reflecting neither creditworthiness nor a strategic role for economic development (Bigsten and Danielson, 2001). High investment rates, maintained throughout the decade, were accompanied by falling productivity. Chronic under-utilisation of capacity became the norm across manufacturing branches (Bigsten and Danielson, 2001). As a result, industrial firms became increasingly dependent on state subsidies to survive.

By the end of the 1970s, over 10% of total government expenditure was devoted to direct subsidies to parastatal enterprises (Gray, 2013). At the same time, the contribution of manufacturing to economic growth had declined to the point of becoming negative. An overvalued real exchange rate, together with limited technical progress, and external shocks, such as the 1973 oil crisis, all contributed to this outcome (Msami and Wangwe, 2016).

[23] By 1973, public enterprises accounted for 46.7% of total manufacturing employment (Msami and Wangwe, 2016).

[24] State control over the banking sector was significant—at its height, the state-owned National Bank of Commerce reportedly accounted for close to 80% of all deposits in the country. Moreover, the country's three development banks—the Tanzania Investment Bank, the Tanzania Development Finance Co. Ltd, and the Tanzania Housing Bank—were all controlled by the state (Bigsten and Danielson, 2001).

4.1.2 From crisis to liberalisation: de-industrialisation and recovery

Tanzania entered the 1980s in recession. Following unsuccessful negotiations with the International Monetary Fund (IMF), the government started a programme of structural reforms with the introduction of the Economic Recovery Programme (ERP) of 1986-89, followed by the Economic and Social Action Programme (ESAP) of 1989-92 (Biermann and Wagao, 1986). The two programmes inaugurated a process of liberalisation, starting with the reduction of controls over prices and production licenses, and with the phasing out of exchange rate controls. A process of restructuring of parastatal enterprises was also initiated, leading to the privatisation of previously nationalized companies (Gray, 2013).[25]

In the aftermath of this process, the manufacturing industry shrank considerably (Gray, 2013). Premature de-industrialisation, coupled with a poor export performance, were among the factors which prompted the introduction of the Sustainable Industries Development Policy (SIDP) in 1996. The overall objective of the SIDP was to achieve industrial development by attracting foreign direct investments (FDI) in the sector, and by expanding domestically-owned small and medium enterprises (SMEs) (Government of Tanzania, 1996). The private sector was identified as the main vehicle for promoting industrial development, while the role of the government was confined to the provision of an enabling business environment (Msami and Wangwe, 2016). In addition, export promotion became an explicit policy goal.

In the mid-1990s, the commitment to industrial development was reaffirmed in the Tanzania Development Vision 2025, with the stated goal of turning Tanzania into a semi-industrialized country by 2025 (Government of Tanzania, 1997). Export processing zones (EZPs) were established in 2002, with the objective of attracting investment in export-oriented industries.[26] Additional measures to support industrial development were the establishment of the East African Community (EAC) in 2000, with the adoption of common tariffs and the elimination of intra-regional trade restrictions (Msami and Wangwe, 2016).

4.1.3 The current industrial strategy of Tanzania

Since the early 2000s, the government has launched various (largely overlapping) strategic documents. Two of them are five-year plans, while the others have a longer-term span. Among all the documents produced since the early 2000s, the first Five Year Development Plan (FYDP I) is the only one which has been updated since then.

In 2005, the Mini-Tiger plan was formulated with a specific and ambitious goal: to help the economy mimic the development path of East Asian Tigers and become a "mini-tiger" by 2020. In particular, it aimed at strengthening the international competitiveness of the Tanzanian economy by identifying its main strengths, weaknesses, and open opportunities in terms of sectors and projects that could contribute to economic development and structural transformation. In doing so, the plan

[25] By 2000, only 1% of manufacturing enterprises remained in state hands (Gray, 2013).

[26] The Export Processing Zones (EPZ) Act of 2002 offered incentives to investors including a ten-year exemption from corporate taxes, remissions from customs duties and VAT, access to an export guarantee scheme, and unconditional transferability of profits and dividends (Msami and Wangwe, 2016).

describes the challenges and targets for the various economic sectors, including manufacturing. In this area, the strategy envisaged in the plan is entirely based on attraction of foreign direct investment (FDI) via tax deductions and the establishment of SEZs. The same strategy is proposed to spur growth of the agro-processing industry, which is among the industries explicitly targeted in the plan. No mention of the wood and furniture industry is found in the policy document.

Launched in 2011 and in place until 2016, the FYDP I was intended to provide a strategy to implement the Development Vision 2025. This strategy comprises five elements: (i) large investments in energy and infrastructure; (ii) strategic investments in specific industries (cotton, agriculture, and manufacturing, especially cement, coal and steel); (iii) investments in skills development; (iv) improvement of the local business environment; and (v) institutional reforms to effectively implement, monitor and evaluate the plan. In terms of the industries of interest to this study, the plan mentions the following initiatives: the Agro-processing Investment Support Loan, Development of Sunflower Oil Clusters, an Edible Sesame Oil Manufacturing Project, and development of various agribusiness SEZ. Despite this, no explanation is given of these initiatives in the policy document. As a matter of fact, there is no trace of implementation efforts of these projects in the country.

The Integrated Industrial Development Strategy (IIDS) 2025, was launched together with the FYDP I. This strategy, concurrent with the Mini-Tiger Plan, was introduced with the aim of strengthening the progress achieved under the SIDP. It comprises mostly horizontal industrial policy measures, predominantly related to infrastructure. While the policy identifies some industries for targeted support, the policy instruments that will be used are not identified. Only in the case of edible oils, VAT tax exemptions are foreseen, together with an *ad hoc* measure which for its very nature cannot be considered part of a long-term strategy.[27]

In 2012, another plan, the Long-Term Perspective Plan (LTPP), was launched to follow up on the implementation framework for the Development Vision 2025. This 15-year long term plan was meant to implement Vision 2025 and out of this plan three consecutive five-year plans are supposed to be elaborated beginning with the first FYDP from 2011. Overlapping with both the Tanzania Development Vision 2025 and the Mini-Tiger Plan, its overarching goal is graduation to middle-income status by 2025. In terms of its economic objectives, the plan acknowledges the potential role, and inherent challenges, of structural transformation. Beyond the discussion of the status of the Tanzanian economy and its various sectors, the document does not refer to any industrial policy tool that the government plans to use to achieve the ambitious goals set in the document. A rather horizontal approach – centred around macroeconomic stability, provision of infrastructures, and investment in human capital – remains the fundamental strategy for industrial and economic development.

The second Five-Year Development Plan (FYDP II), launched in 2016 and in place until 2020, shares the approach and several of the objectives of the previous plan. As in the FYDP I, emphasis is put on human capital and skills, business environment, monitoring and evaluation. As a new goal,

[27] This refers to the construction of a small capacity refinery in Dodoma.

the plan includes the mainstreaming of global and regional policy goals, such as the Sustainable Development Goals (SDGs), into government policy. It identifies manufacturing industries that constitute priority areas for government support. These are agro-processing (textiles, leather and leather products, and food processing) and basic industries (e.g., fertilizer and chemicals), light machinery, iron, and steel. Within agro-processing, specific products are mentioned for support: cashew nuts, oil seeds and oleaginous fruits, vegetable fats and oils, sunflower seed/safflower oil, palm kernel/babassu oil. Wood and furniture, instead, are considered industries where Tanzania is losing its comparative advantage and world demand is falling, thereby reducing the urgency and need for policy support. In terms of policy instruments, and similarly to other policy documents, the plan foresees infrastructure building, whether in SEZs, export processing zones (EPZs), industrial parks, or incubation centres. While credit guarantees are mentioned to support growth of micro and small enterprises, infrastructural projects and SEZs appear as the only industrial policy instruments identified for the agro-processing industry.

To sum up, Tanzania certainly has formulated a wide array of strategies, making an important effort in identifying major challenges to growth and competitiveness and setting relative objectives and targets. At first sight, the policy approach behind these documents seems to acknowledge the role that structural transformation and manufacturing have for the development of the local economy. Several documents, for example, propose selected manufacturing industries for industrial targeting. Despite this, however, these policy documents place a much greater emphasis on horizontal industrial policies such as infrastructure building, human capital formation, improvement of the business environment, and macroeconomic stability. All too often, vertical industrial policies in support of the identified industries are lacking and the policy documents remain rather vague on the policy instruments that should be used on the ground to operationalise them. As Table 2 below shows, SEZs are by and large the only policy instrument explicitly mentioned across all policy documents.

Beyond these issues which affect the design/formulation stage of industrial policymaking, two additional challenges are identified at the implementation stage. First, despite the numerous policy initiatives, progress in their implementation remains inadequate (Kweka, 2018). Second, a key constraint to policy implementation is related to the government's limited fiscal capacity, particularly to finance infrastructure projects and the acquisition of industrial land (Kweka, 2018). This seems also reflected in the prioritization of horizontal versus vertical industrial policies, and the lack of financial incentives to spur manufacturing growth. However, the Government is pursuing a two-pronged strategy of contracting foreign debt and increasing domestic revenue mobilisation in order to finance the much-needed revamping of infrastructure.

Finally, and of particular relevance to this study, our analysis of the industrial policy strategy of Tanzania reveals that the agro-processing industry has long featured among the industries that deserves government attention. Thanks to its backward linkages with the agricultural sector and its potential in terms of export earnings and employment generation, agro-processing has been considered a viable route to industrialisation and value addition. Wood and furniture, in contrast, is not a priority industry for the Tanzanian government and virtually no support is foreseen for it,

based on the policy documents analysed here, except for the recent directive to all government offices to procure furniture locally rather than import furniture. However, the government did not put in place policies to support manufacturers in this sector to develop their technological capabilities in order to raise the quality of their products.

Table 3 summarises the policy instruments currently in place in the country. For each policy document currently in place, the table specifies the industrial policy instruments that target the manufacturing sector as a whole and the two industries under exam in this paper. For each of these policy instruments, the table also indicates the degree of implementation, based on secondary literature.

4.1.4 Industrial policy for horticultural processing and wood and furniture

While agro-processing industries feature in numerous policy documents, specific mentions of horticulture and horticultural processing do not appear frequently. Small-holder horticultural development, for instance, features in the *Kilimo Kwanza* (Agriculture First), the government's umbrella agriculture policy. Policy documents, however, fall short of specifying clear support measures for the sector. Thus, horticulture seems to lack government support (HODECT, 2010).

Similarly, the Tanzanian government does not have any policy or strategy in place to support the wood products and furniture industry. The support manufacturers receive is limited to horizontal policies, related to either waiving of duties and value added tax, or providing refunds for these levies to exporting firms (Global Development Solutions, 2011). Some other measures have been introduced, albeit in an *ad hoc* manner. An example is the imposition of bans to the export of logs and sandalwood, first introduced in 2004 and then renewed in 2007. The ban was meant to address concerns over deforestation in the country and, at the same time, to incentivize the local manufacturing of wood. It was not accompanied by complementary policies, and its impact is difficult to assess. The ban encountered protests from wood exporters, some of whom reportedly continued to export logs and sandalwood illegally (Global Development Solutions, 2011).

Box 2. The success of Ethiopia in floriculture: An example for other countries?

Ethiopia is rapidly developing into an East African horticulture leader, particularly in the floriculture sub-sector. From being a negligible player in the sector, in 2015 the country had risen to account for over 9% of the global market (Lichtfouse, 2018). Ethiopia is now Africa's second and the world's seventh largest exporter of flowers. Based on UN COMTRADE data, export earnings from cut-flowers jumped from an estimated $144,000 in 1997 to over $737 million in 2015. Floriculture is now one of the country's foremost hard currency earners, accounting for more than 6% of all export earnings. The sector's success was made possible by a mixture of foreign investment and a supportive government policy—a combination of factors that is not necessarily difficult to replicate.

Ethiopia's horticultural exporters are majority foreign-owned. Foreign firms account for 70% of the sector, with another 10% being joint ventures with foreign investors (Iizuka and Gebreeyesus, 2017). Foreign as well as domestic cut flower producers have been organised since 2004 in the Ethiopian Horticulture Producers and Exporters Association (EHPEA) (Schaefer and Abebe, 2015).

While in the industry's early stages no policy was targeted at the horticulture industry, soon after its foundation EHPEA negotiated a programme of support with the government which resulted in the sector being granted 'priority' status within the Industrial Development Strategy of 2002. Successive policy initiatives, such as the second Plan for Accelerated and Sustained Development to End Poverty (PASDEP, 2005-2010) reinforced the government's commitment to the sector. PASDEP introduced investment incentives, including a profit tax break of up to five years, provisions for loss rescheduling and duty-free privileges on all capital goods and construction materials imported by horticultural exporters (Iizuka and Gebreeyesus, 2017). In addition, in 2008 the government established the Ethiopian Horticulture Development Agency (EHDA) to support the sector's growth, offering capacity building, investment support and market promotion. It has been instrumental in pushing for the implementation of export promotion measures, such as a voucher scheme and duty-drawbacks (Oqubay, 2015).

In addition, the Ethiopian government has actively intervened in markets for credit, land and labour. The Development Bank of Ethiopia (DBE) has been instructed to provide finance to the sector at subsidised interest rates, and with no collateral requirements, since the mid-2000s. Lending interest rates offered by the DBE have oscillated between 7.5% and 8.5% in the past decade (Schaefer and Abebe, 2015). This is highly competitive when compared to rates in Ethiopian commercial banks. The provision of publicly owned land at affordable prices has constituted another key government initiative. While initially investors used to acquire land from smallholder farmers, in a later stage the government centralised the land allocation process—often displacing previous dwellers—and started allocating land at cheaper prices than in other countries (Lavers, 2012; Oqubay, 2015).

The government has also intervened in labour markets, by organising workers in a single, state-run union. Moreover, it has subsidised high-quality air transport services and airport cold storage facilities through the highly successful state-owned company Ethiopian Airlines. In the aftermath of the global oil price hike in 2008-9, the government decided to subsidise 60% of the cost increase in order to shield exporters (Oqubay, 2015). It is telling of the industry's perceived importance among Ethiopia's policy circles that the decision followed an earlier cut to fuel subsidies for transport use and households.

Horticultural development in Ethiopia is not devoid of challenges. All the main inputs—seed varieties, fertilisers and pesticides—are still imported from abroad, limiting the scope for value-addition in the domestic economy, particularly in downstream industries. Similarly, linkages to the wider economy remain under-developed, and domestic entrepreneurship lags behind foreign investors. Some of these conditions may be changing, however. Recently, for instance, a domestic packaging industry emerged to supply horticulture exporters with material that was previously imported.

Source: Authors.

Table 3. Industrial policy documents and instruments currently in place and affecting the agro-processing and wood/furniture industries

Policy document	IP tools targeting manufacturing	Degree of implementation of IP tools for manufacturing	Agro-products mentioned in policy document	IP tools targeting agro-processing	Degree of implementation of IP tools in agro-processing
Mini-Tiger Plan 2020 - launched 2005 and covering 2005-2020	Attraction of FDI (tax incentives)	Various firms in SEZs are foreign-owned			Various firms in SEZs are foreign-owned
				Agro-processing SEZ	Various SEZs established
Integrated Industrial Development Strategy 2025 - launched 2011	Infrastructure development (e.g., Micro Manufacturing Enterprise Parks)		Sunflower seed oil; food-processing; cashew-nuts processing; fruits processing	VAT exemptions for vegetable edible oil	
	SEZs			Agri-business SEZ	
Second Five Year Development Plan (FYDP II), 2016/17 – 2020/21	SEZs and EPZs				
	Industrial parks	Construction of various parks started			Construction of various parks started
	Promotion of MSMEs (incubation centers and credit guarantee scheme)				
	Infrastructure building	Various projects started		Agro-processing infrastructural projects	Various projects started

Source: Authors' elaboration based on government's policy documents.

Notes: IP tools includes only instruments of industrial policies such as tax incentives, loans, tariffs, local content requirements and so on. Objectives such as "Strengthening R&D institutions" are not included in the table. *Ad hoc* measures are also not included in the table. In the plans, specific initiatives are often mentioned (e.g., installation of sunflower oil production and packaging facility; construction of an oil refinery). Despite important initiatives for the development of these industries, these cannot be considered industrial policy tools as they are *ad hoc* measures implemented occasionally, which do not guarantee continued support to local entrepreneurs.

4.2 How Malaysia became a global player in the palm oil industry

At the world level, demand for oils has grown in recent years owing to growing populations, rising incomes, increasing consumer preferences for vegetable oils, and growing production and use of biofuels (Tong, 2017). With the highest oil yield among oilseeds and oil crops, palm oil accounts for a significant portion of world's demand for oils. According to FAO statistics, palm and palm kernel oil accounted for over 35% of global vegetable oil production in 2013.

Today Malaysia is among the world-leading exporters of palm oil, contributing almost 30% of total palm oil exports.[28] Given its impressive historical trajectory in the production and export of palm oil, it represents an instructive case study.

Recognizing the opportunity of resource-based industrialisation, since the 1960s the Malaysian government, in coordination with public agencies such as FELDA (Federal Land Development Authority) and private business associations, has supported the growth of oil palm cultivation and of downstream processing for export.

Schematically, the Malaysian industrial policy strategy for the palm oil value chain can be divided into two phases. Initially, Malaysia had only one product for export—crude palm oil (CPO).[29] Against the advice of international organisations who suggested that the country's comparative advantage lay in raw production rather than processing, the government introduced incentives and subsidies aimed at stimulating value addition, by promoting domestic refining and exporting of processed palm oil (PPO) and palm oil related products.[30]

As shown in Table 4, the policy mix included incentives to exports and new investment, as well as incentives to R&D, and support for training and skills' accumulation (Rasiah and Shahrin, 2005). The private sector joined the efforts of the government, for example forming the Oil Palm Genetics Laboratory (OPGL), a consortium of four private plantations that got together to carry out research in oil palm breeding.

First introduced in 1976, export duties on CPO were over time structured according to a graduated system which awarded duty exemptions to processed products based on their degree of processing (Tong, 2017). Export duties on CPO were accompanied by duty exemptions on the export of PPO (Chandra, 2006). The two measures increased the cost of exporting CPO over PPO and palm-oil-related products and proved to be successful in stimulating processing. Interestingly, the exemption available to PPO producers did not entail a transfer of government resources from other sources, even when the industry was not

[28] Based on UN-COMTRADE data.

[29] British Malaya had been the world's largest rubber producer. After independence, declining rubber prices led to a switch to oil palm at large plantations (Tong, 2017).

[30] Refineries were rare in post-independence Malaysia. In the early days of the industry, cooperatives of palm oil growers had attempted to run refining plants and coordinate marketing and shipment activities. The refusal of large, foreign-owned plantations to participate led to the initiative's failure. In the early 1970s the government stepped in and started nationalising plantation interests through negotiated transfers and hostile takeovers (Tong, 2017).

profitable (Rasiah and Shahrin, 2005). In order to further stimulate investment in processing capacity, oil palm firms were granted incentives on corporate income taxes, excess profit and development taxes (Rasiah and Shahrin, 2005).[31] Capital spending was also made eligible for tax exemptions.[32]

Overall, early industrial policies were largely successful in promoting a shift from CPO to PPO. By 2014, the share of CPO in total palm oil exports had declined to a fifth from 100 percent in the early 1960s (Tong, 2017). While tax holidays, export incentives and other incentives certainly all contributed to the shift to downstream processing, so did improvements upstream in CPO cultivation. Over the period from 1975 to 2014, yields for CPO and crude palm kernel oil almost doubled (Tong, 2017). Improved yields reflected increases in land under cultivation and, perhaps more importantly, improvements in processing efficiency owing to the gradual introduction of better agricultural technology, inputs and seeds.

Indeed, public funding to research in areas such as agronomics and biotechnology was—and remains—an important aspect of the industrial policy for the palm oil industry in Malaysia. Technologies which originated from public research institutes include new milling processes, as well as tools and machinery for harvesting, transporting and collecting palm fruits. Over time, these investments contributed to the emergence of a set of SMEs producing and distributing equipment and parts in the input segment (Tong, 2017).[33] Research efforts by both private and public entities also resulted in the development of an improved seed variety, the high-yield *Tenera,* exports of which, due to their strategic importance for the industry, have been banned by the government since the early 1970s (Durand-Gasselin and Cochard, 2005; Tong, 2017).[34]

By the 1980s, PPO had become the main palm oil product for export in the country, leading to a shift in policy. In this second phase, industrial policy concentrated on creating linkages with downward and upward activities and diversifying into different segments of the industry within the value chain, while at the same time expanding exports of PPO and palm oil related products (Rasiah and Shahrin, 2005).

The first Industrial Master Plan (IMP) of 1986-1995 targeted, in particular, the oleo-chemical industry. As of 2014, oleo-chemical products contribute to approximately 20% of total export value, and Malaysia has become the world's largest producer (Tong, 2017). Concurrently, tariffs on CPO exports were reduced, as PPO and the inputs used in production were deemed competitive and of world-class quality (Rasiah and Shahrin, 2005).

[31] Early industrial policy clearly targeted palm oil processing. For example, starting in 1968, palm oil refineries could obtain "pioneer status" from the government. Pioneer firms could then access significant tax privileges (Rasiah and Shahrin, 2005).
[32] Industrial policy was not devoid of problems, as large investments in refining led to overcapacity issues that persist to this day (Tong, 2017).
[33] Fertilisers, agrochemicals and heavy machinery, such as tractors, remain largely imported (Tong, 2017).
[34] The ban was only relaxed in 2013 to allow the export of seeds to overseas plantations that are controlled by Malaysian interests by over 70 % (Tong, 2017).

The second IMP (1996-2005) attempted to broaden manufacturing capabilities by incentivizing biotechnology research and developing complementary industries (Rasiah and Shahrin, 2005). Particular emphasis was placed on the provision of incentives to stimulate R&D activities in manufacturing as well as investments in new skills and capabilities (Rasiah and Shahrin, 2005).

Knowledge-related activities - such as R&D and training - remain the focus of the current IMP (2006-2020), which aims at diversifying production into a wider range of higher value-added palm oil while creating linkages with downstream products such as rubber and oleochemicals.[35] To this end, the government has increased direct R&D funding and started developing research collaborations with multinational corporations (MNCs) active in downstream sectors. In order to expand the oleochemical industry and establish a bio-diesel industry, the government has also undertaken investment and encouraged FDI.

Licensing and commercialisation efforts are also ongoing. Publicly funded innovations in priority areas, ranging from phytonutrients extraction to bio-diesel, are then licensed to private firms for commercialisation. Interestingly, the Malaysian Palm Oil Board (MPOB), a government agency, is the world's most active patent applicant in the fields of palm oil production and palm waste treatment and exploitation. Since 1995, it has filed approximately 200 patent applications in these two fields, well ahead of private and public bodies in countries such as China, Germany and the U.S. (WIPO, 2016).

Three main policy recommendations can be learned from the experience of Malaysia. First, industrial policy can create new industries by helping them emerge, grow, and become competitive in international markets. This requires a mix of policy tools that tackle different obstacles and needs of the industry. This policy mix needs to be periodically evaluated and adjusted to reflect the status of the industry. As Hausmann and Rodrik (2003) have put it, economic development is a self-discovery process in which governments and firms discover which products they are good at producing through trial and error. By experimenting with different industrial policy tools in different industries and contexts, governments can contribute to this self-discovery process and help firms discover new profitable business opportunities.

Second, industrial policy needs to be fiscally sound. Many countries, especially at low-income levels, lack the financial space to deploy a complex industrial policy. This is even more important when we consider that often it is difficult to anticipate the chances of success, leading to potential losses in terms of fiscal revenues. By leveraging export duties to finance export tax reductions, the Malaysian government minimised the burden of this industrial policy on other industries. This lesson can be applied to a variety of resource-based manufactured products whose primary (raw) product is competitive in international markets.

[35] See Malaysia's Third Industrial Master Plan (IMP3), pp. 465 – 485.

Third, diversification into processed activities can serve as more than just a hedging strategy against the inherent volatility of primary commodity prices. It can also be a springboard to develop industrial linkages to downstream and higher value-added activities which, over time, may help develop complementary capabilities around primary commodities, including science and technology capabilities (Rasiah and Shahrin, 2005; Chandra, 2006).

Table 4. Industrial policy instruments in support of the palm oil industry, Malaysia, 1960s - present

	Policy objective	**Policy domain**	**Policy initiative**
1960s	Create a knowledge base	Science	Establishment of an exchange program with foreign universities.
	Encourage capital investments	Production and upgrading	• Tax exemptions on capital investments; • Licences on refineries.
1970s	Support, coordinate, and regulate the industry	Production and upgrading	Establishment of the Palm Oil Registration and Licensing Authority (PORLA).
	Create a knowledge base	Science	• Establishment of the Palm Oil Research Institute of Malaysia (PORIM); • Establishment of the Universiti Putra Malaysia to train agricultural and agro-industrial engineers and agro-business graduates.
	Create linkages with upstream and downstream industries	Production and upgrading	Tariffs on inputs (e.g., bleaching earth).
	Encourage capital investments	Production and upgrading	• 40% corporate income tax rebates for 2 years; • Tax holiday for 7 years for refineries with "pioneer status".
	Foster exports and upgrading	Trade / Production and upgrading	• Export tax on crude palm oil; • Export duty exemptions on processed palm oil.
1980s-mid-1990s	Encourage value addition and exports	Trade / Production and upgrading	Tax incentives to exporters (including abatement of corporate income tax amounting to 50% of export sales).
	Deepen manufacturing capabilities	Research and development	• Tax allowance of 50% on R&D expenditures over 10 years; • R&D activities within PORIM (including new product development).
	Create a knowledge base	Science	• Incentives to stimulate staff training;

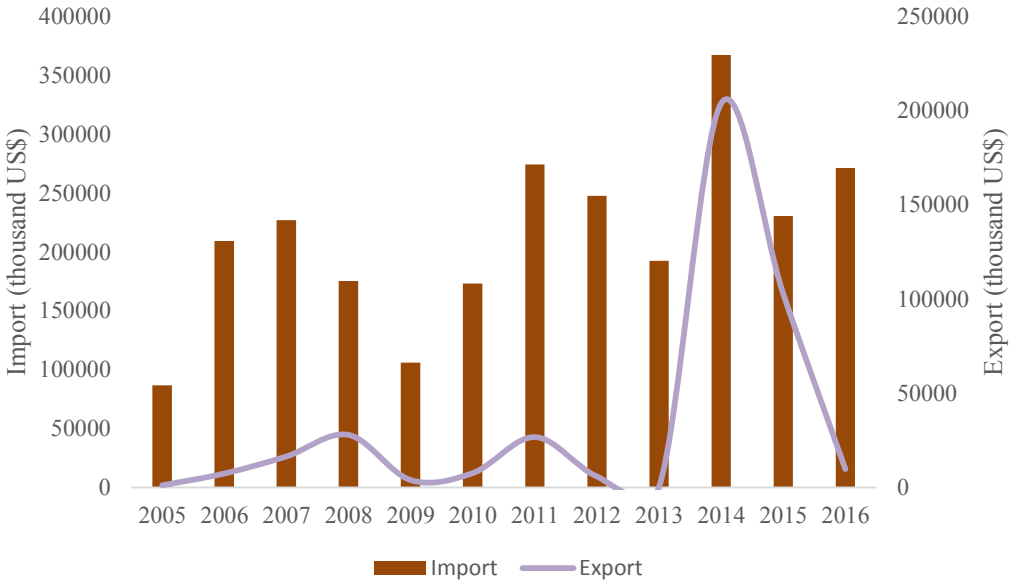
			• Training through PORIM; • Establishment of the Human Resource Development Fund.
Mid-1990s - present	Create linkages with upstream and downstream industries	Production and upgrading	• Incentives to manufacture oil-processing machinery equipment; • Establishment of industrial clusters.
	Encourage value addition and upgrading through product diversification	Research and development	• Public funding for the development of new technologies and products—both in palm oil processing and in downstream industries such as oleochemicals; • Licensing of publicly funded innovations to private firms; • Strategic collaborations with MNCs to enhance R&D in selected segments of the industry.
	Encourage value addition and upgrading through product diversification	Production and upgrading	• Encouragement of domestic and foreign investment in bio-diesel production and the oleochemical industry; • Incentives for outward investment in major consuming markets, such as China, the EU and Pakistan.

Source: Authors based on policy documents and Rasiah and Shahrin (2005).

Box 3. The status of the palm oil industry in Tanzania

Tanzania is a large consumer of palm oil, but its production capabilities in this industry are currently slim, even though the country has significant potential in this industry. While lucrative in Malaysia and other parts of East Asia, in Tanzania this industry still offers meagre salaries and generates low incomes. All value chain activities are labour-intensive, actors operate at the subsistence level, and usage of modern technologies and R&D efforts are limited or inexistent (UNIDO, 2019). Tanzania is a net importer of palm oil (Figure B2). The country is estimated to be the world's 12th largest importer of crude palm oil, with domestic demand set to increase in the next years (UNIDO, 2019). In light of the country's limited production and processing capabilities, the export spikes observed in 2014 and 2015 are likely to reflect re-exports rather than exports of local produce (Jahari and Kilama, 2018).

Figure B2 – Import and export of palm oil, 2005-2016



Source: FAOSTAT (last accessed 19/07/2019).

Government's intervention in support of this industry is summarised in Table B2 below.

Table B2 – Industrial policies in support of the palm oil industry

Measure	**Objective**	**Issue identified**
Tariffs (25% on CPO and 35% on semi-refined and refined oil)	Encourage value addition	Without targeted support to domestic producers, tariffs are unlikely to achieve their primary goal.
Extension and advisory services	Create a knowledge base	Knowledge level and capacity of service providers are insufficient.
Special economic zones	Attract investment	Inadequate infrastructure and difficulties to meet export requirements undermine the impact

		of this policy tool.

Source: Authors based on UNIDO (2019).

Source: Authors.

4.3 Vietnam's rise as an exporter of wooden furniture

In recent years, Vietnam has emerged as the leading exporter of wooden furniture in South East Asia. According to UN-COMTRADE data, Vietnam's furniture exports have climbed from under $300 million in 2000 to over $7 billion in 2017. The industry currently employs over 450,000 workers, representing approximately 7% of manufacturing employment, and 4% of manufacturing value added.[36] Owing to the fast growth of the sector in recent years, wood and wooden products currently rank as Vietnam's sixth product group for export (Anh et al., 2014).

Following the example of other East and South-East Asian countries (see Section 4.4.2 for the case of Malaysia), in the last decades Vietnam has pursued an active industrial policy aimed at spurring structural change in favour of manufacturing industries. The government's commitment to foster manufacturing activities is clear from all its policy documents. While it is beyond the scope of this paper to delve into the details of the current industrial strategy of the country, a short discussion of some of its policy instruments can shed light on how the growth of a dynamic wood and furniture industry can be supported in Tanzania (Table 5).[37]

[36] UNIDO INDSTAT 4 2019, Rev. 4.

[37] This section provides a brief overview of industrial policy trends in the last two decades. For a comprehensive treatment of Vietnam's industrial policy during the pre-1986 socialist period and the early *Doi Moi* years, and of the similarities between Vietnam and Tanzania, see Gray (2018).

Table 5. Industrial policy tools in support of the wood and furniture industries in Vietnam

Policy objective	Area of intervention	IP instrument used
Support growth of forest plantations	Production	• Land tax exemptions; • Interest rate reductions; • Bans on forestry products.
Encourage investments	Production	• Credits for investment capital; • Lower lending interest rates for SMEs; • Credit guarantee schemes.
Promote exports	Trade	• Export credits from the Vietnam Development Bank; • Trade promotion programmes, including the diffusion of trade information and market research; training activities; and organization of trade fairs, as well as support for the participation to trade fairs.
Diversify and move up the value chain	Production and upgrading	Creation of the Vietcraft Excellence label
	Trade / Investment / Production and upgrading	• Export duties and bans on semi-processed wood; • Encouragement of joint ventures between plantation establishments, log processing and export-oriented manufacturers; • Elimination of import duties on wood.
Attract FDI	Infrastructure building / Trade / Investment / Production and upgrading	• Establishment of industrial zones (IZs); • Duty-free access to all production inputs; • Access to subsidized infrastructure; • Tax exemptions for firms in IZs.
Foster linkages with FDI	Investment / Production and upgrading	• Supplier development programs and finance; • Provision of incentives to firms supplying to MNCs; • Joint ventures with local firms encouraged.

Source: Authors' elaboration based on secondary sources.

Vietnam's industrial policy for the promotion of wood processing and furniture production has been based on two key pillars. These are: i) the attraction of foreign capital and expertise, particularly in

the furniture segment of the industry, through fiscal incentives and infrastructure provision; and ii) the support of domestic SMEs with a policy mix that includes the provision of credit and credit guarantees, trade promotion activities, and human capital development programmes (UNCTAD, 2018).

As for other ASEAN countries, Vietnam has implemented a rather comprehensive strategy to attract FDI, integrate foreign actors in the domestic economy, and foster spillovers and technology transfer between foreign and domestic enterprises. Vietnam has certainly benefited from its geographical location within a high-growth, rapidly industrializing region. At the same time, it has also pro-actively introduced policies and incentives to increase its attractiveness to MNCs and enhance its role as a regional platform where foreign firms can produce for export markets while also catering to domestic consumers.

In order to incentivize FDI flows in the economy, Vietnam first introduced Export Processing Zones (EPZs) in 1991 with the offer of duty-free access to all inputs and various tax concessions for industries locating within the area. In 1994 the government also introduced a policy for Industrial Zones (IZs), allowing MNCs to set up shop—or establish joint ventures with local firms—in order to cater to both international and domestic markets. Industrial zones were established on subsidized land, with access to modern infrastructure and fiscal incentives (Vo and Nguyen, 2012). Vietnam's FDI legislation, first introduced in 1992, experienced major revisions in 1996 and 2000 to strengthen incentives and facilitate access into domestic markets, also following growth of local incomes and consumption.

In the early phase, EPZs experienced mixed results, having to compete for FDI with other East and South East Asian countries with a longer experience with EPZs, and better infrastructure.[38] EPZs were soon superseded by IZs, which offer greater flexibility to foreign producers, including the possibility to access a rapidly-growing domestic market. Besides receiving fiscal incentives, since 1996, foreign firms establishing themselves in IZs have benefited from the removal of import duties on machinery, equipment and raw materials. Vietnam's FDI policy also encourages foreign firms to purchase equity in domestic enterprises and establish joint ventures. In addition, it provides land and construction sites—which, since the legislative reform of 2000, can be used as collateral to obtain loans from commercial banks—with infrastructure access, at subsidized rates (Vo and Nguyen, 2012). Some of these incentives, such as import duty exemptions, also apply to domestic firms supplying to MNCs (Vo and Nguyen, 2012).

As a result of these policies, and thanks to its cost competitiveness relative to regional incumbents, since the mid-2000s Vietnam has attracted the attention of foreign investors, including large furniture multinationals such as IKEA. The furniture sub-sector is increasingly constituted by foreign firms. According to some estimates, in 2011, the share of foreign firms in the sector was at

[38] Vietnam launched its first EPZ in 1991, three decades after their first establishment in other East Asian countries, and from a poor infrastructural and human capital base. International conditions were changing too, with protectionist tendencies in industrialized economies and the 1997 Asian financial crisis greatly reducing investor's appetite for the EPZ model right at the time when Vietnam first started experimenting with it (Vo and Nguyen, 2012).

over 46%, up from 35% in 2005. By contrast, the share of foreign-owned enterprises in the wood sub-sector was 14% in 2011 (Anh et al., 2014).

Apart from the establishment of EPZs and IZs, Vietnam's government has also acted to improve the performance and international competitiveness of domestic SMEs. Access to credit is one of the key areas of government intervention, where the government has increased the availability of credit for investment capital and provided export credits to both foreign and domestic producers.[39] Credit guarantee schemes for SMEs, backed by government funding, are one of the policy tools with which Vietnam's government is currently experimenting.

Another increasingly important policy objective is to increase adherence to international quality standards and create solid domestic brands, thereby raising the competitiveness of Vietnamese products.[40] To this end, the government initiated a series of initiatives including the establishment of the Vietcraft Excellence label. The label certified sustainable products along the value chain, thus offering local firms access to higher-value-added, higher-margin markets.

Another important area of industrial policy is export promotion, a cornerstone of industrial policymaking in East and South-East Asian countries. Beyond export credits, government policies include the provision of financial support for participation in international trade fairs and marketing missions (VIETRADE, 2006). Trade promotion events and training are also provided by the sector's business association, the Vietnam Association of Timber and Forest Products (VIFOREST). Finally, wood products and furniture makers can access credit at favourable rates from the Development Bank of Vietnam, among other domestic sources. Exporters in particular qualify for a number of subsidies, whether to finance imports of machinery and other inputs, or to hire international experts to advise on export growth strategies (VIETRADE, 2006).

Finally, it is worth noting that policy instruments have been introduced throughout the entire value chain. Forestry and its processing industry are explicitly mentioned in policy documents.[41] Vietnamese policies in this segment of the industry primarily aim at preserving forests and increasing the processing ratio of domestic firms. In particular, the Vietnamese government provides fiscal and financial incentives including land tax exemptions and interest rate reductions to support the growth of domestic forest plantations.

Export duties and bans on forestry products and semi-processed wood are used to preserve national forests and spur growth of the processing industry (Global Development Solutions, 2011; Fyfe, 2012). At the same time, joint ventures between plantation establishments, log processing and export-oriented manufacturers are also encouraged (VIETRADE, 2006). To further support wood processing for export, the government has also cancelled import duties on wood materials. Moreover, producers receive various subsidies, for example on electricity prices (Global Development Solutions, 2011).

[39] See the Five-Year Socioeconomic Development Plan 2016-2020.
[40] See for example the Industrial Development Strategy through 2025, Vision toward 2035.
[41] For example, the Socio-Economic Development Strategy 2011-2020 explicitly mentions the need to sustainably develop forestry industry and its processing industry by attaching forestation for materials to processing industry right from the planning phase of new investment projects.

5 Conclusions and policy recommendations

Like many other developing countries, Tanzania is in tremendous need of an engine of structural transformation that can create enough good-quality jobs for its increasing population while raising productivity and creating opportunities for productive investments throughout the economy. For decades development economists have argued that manufacturing activities have the potential to ignite socio-economic development as no other economic sector can do. Given the current economic structure of the country (reliant on agriculture) and its abundance in natural resources, a resource-based industrialization strategy seems to offer concrete opportunities for value addition and upgrading. In a number of other developing economies, including Malaysia but also Ethiopia and South Africa, the industrial processing of natural resources has stimulated a process of technological upgrading and the development of linkages to upstream and downstream industries.

In light of these observations, this paper has studied the horticultural and wood and furniture industries in Tanzania, analysing their current status in the economy and their role in their respective value chains. It identified a number of challenges that seem to impede their expansion, as well as analysed the industrial policy tools currently in place to support local businesses. Finally, and in order to offer concrete examples of how these industries can be transformed into engines of structural change, the paper discussed the cases of the palm oil industry in Malaysia and the wooden furniture industry in Vietnam.

The findings of this paper can be summarised as follows. First, while abundant in the natural resources needed to fuel agro-processing, Tanzania's processing activities are currently very limited. Apart from a handful of larger companies, the vast majority of local firms are small and informal. Their small scale and low technological profile, compounded by low capacity utilisation, severely hinder their ability to increase production and improve the quality of their products. Beyond the constraints created by the small scale of production and limited use of modern equipment and technology, local firms suffer from infrastructure bottlenecks, limited availability of high-quality inputs and skilled labour, difficulties in accessing credit, and an unpredictable regulatory and fiscal framework.

Another key finding of this paper concerns the role of public policies. In this regard, the paper finds that although the Tanzanian government has outlined its vision and goals for structural transformation and socio-economic development in various policy documents, existing policy falls short of designing a comprehensive strategy and detailing the industrial policy tools that will actually do the job. In the case of the two sectors of interest here, some of the policy documents explicitly mention agro-processing as a key industry for the country. However, based on policy documents, the only form of support mentioned for this industry is the establishment of SEZs and the directive to government institutions to procure furniture solely from local firms. As far as the wood and furniture industry is concerned, the Tanzanian government does not have any industrial strategy targeted to support local producers. Fiscal incentives and SEZs are the only forms of support to producers of wood products and furniture. The inadequate support offered by the Tanzanian government is evidenced also in sectoral studies, for example on the palm oil industry

(see for example UNIDO, 2019), in our fieldwork (see Section 3) as well as in production data (see Section 2.4).

Arguably, SEZs, EPZs, and IZs have proved to be successful in stimulating investment and creating entirely new industries. At the same time, various case studies have shown that by themselves these instruments cannot accomplish the task. In order to be successful, they require complementary investments in infrastructure and education as well as a more comprehensive strategy to make them effective in the long run. Such a strategy might include instruments of trade policies as well as science, technology, and innovation policies. Examples include incentives to strengthen skills and capabilities in the local workforce, incentives to stimulate linkages between firms in the SEZs and the rest of the economy, as well as incentives to encourage value addition and technological upgrading in regional and global value chains. The cases of the Philippines and Costa Rica provide interesting examples of the issues mentioned here (see, for instance, Paus, 2014 and Guadagno, 2015).

These observations take us to one of the most significant contributions of this paper, which is to bring evidence on concrete examples of industrial policy tools that supported the successful development of agro-processing activities in countries that were—and are—at a similar level of development relative to Tanzania. The cases of palm oil in Malaysia and wooden furniture in Vietnam teach at least two important lessons to Tanzanian industrial policy making. First, industrial targeting requires a comprehensive and sector-tailored industrial strategy that goes beyond scattered or *ad hoc* interventions. Such strategies are designed as bundles of industrial policy instruments that reinforce each other and create the right set of incentives for productive investment. Second, in order to make these industries engines of long-term development, science, technology, product quality, and innovation must be key priorities. This implies that the government cannot only be a provider of public goods and tax rebates, but needs to be a strategic player in the industry, promoting technological advances and actively contributing to the design of business strategies that aim at achieving high-quality production and sustainable competitive advantages.

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Annex 1. ISIC and HS02 codes for processing of horticultural goods

For the sake of this paper, the horticultural processing industry is captured by two ISIC codes: Processing and preserving of fruit and vegetables (ISIC 1030) and Manufacture of wines (ISC 1102). Based on the definition of these two ISIC codes, the following HS02 codes have been selected (see Table A1 below).

Table A1. HS02 codes comprising processed horticultural goods

HS02 code	HS02 name
1507	Soya-bean oil and its fractions
1508	Ground-nut oil and its fractions
1509	Olive oil and its fractions
1510	Other oils and their fractions, obtained solely from olives
1511	Palm oil and its fractions
1512	Sunflower-seed, safflower or cotton-seed oil
1513	Coconut (copra), palm kernel or babassu oil
1514	Rape, colza or mustard oil
1515	Other fixed vegetable fats and oils
2103	Sauces and preparations therefor
2105	Ice cream and other edible ice, whether or not containing cocoa
0710	Vegetables (uncooked), frozen
0711	Vegetables provisionally preserved
0712	Dried vegetables, whole, cut, sliced, broken or in powder
0802	Other nuts, fresh or dried
0803	Bananas, including plantains, fresh or dried
0804	Dates, figs, pineapples, avocados and mangosteens, fresh or dried
0805	Citrus fruit, fresh or dried.
0811	Fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter
0812	Fruit and nuts, provisionally preserved (for example, by sulphur dioxide gas, in brine, in sulphur water or in other preservative solutions), but unsuitable in that state for immediate consumption.
0813	Fruit, dried, other than that of headings Nos. 08.01 to 08.06; mixtures of nuts or dried fruits of this Chapter.
0814	Peel of citrus fruit or melons (including watermelons), fresh, frozen, dried or provisionally preserved in brine, in sulphur water or in other preservative solutions.
0904	Pepper of the genus Piper; dried or crushed or ground fruits of the genus Capsicum or of the genus Pimenta.
2001	Vegetables, fruit, nuts and other edible parts of plants, prepared or preserved by vinegar or acetic acid.
2002	Tomatoes prepared or preserved
2003	Mushrooms and truffles, prepared or preserved

2004	Other vegetables prepared or preserved
2005	Other vegetables prepared or preserved
2006	Vegetables, fruit, nuts, fruit-peel and other parts of plants, preserved by sugar (drained, glacT or crystallised).
2008	Fruit, nuts and other edible parts of plants, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included.
2009	Fruit juices (including grape must) and vegetable juices
2007	Jams, fruit jellies, marmalades, fruit or nut pastes
1105	Flour, meal, powder, flakes, granules and pellets of potatoes.
2204	Wine of fresh grapes, including fortified wines
2205	Vermouth and other wine of fresh grapes
2206	Other fermented beverages (for example, cider, perry, mead); mixtures of fermented beverages and mixtures of fermented beverages and non-alcoholic beverages, not elsewhere specified or included.

Source: Authors' elaboration.

Notes: Vinegar is not included in export data because there is no straightforward correspondence between export and production data. Vegetables, fruits and nuts preserved in sugar are not included in ISIC 1030, but are included in export data (HS02: 2006). Cashew nuts (HS02: 0801) are not included because the majority are exported in shell. Grapes (HS02: 0806) are also not included because in the last 5 years they were exported only fresh. Export codes 0802, 0803, 0804, 0805, 0811 include fresh as well as processed goods.

Annex 2. ISIC and HS02 codes for the wood and furniture industry

For the sake of this paper, the wood and furniture industry is captured by the following ISIC codes: Sawmilling and planing of wood (ISIC 1610); Manufacture of veneer sheets and wood-based panels (ISIC 1621); Manufacture of builders' carpentry and joinery (ISIC 1622); Manufacture of wooden containers (ISIC 1623); Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials (ISIC 1629); and Manufacture of furniture (ISIC 3100). Based on the definition of these ISIC codes, the following HS02 codes have been selected (see Table A2 below).

Table A2. HS02 codes for the wood and furniture industry

HS02 code	HS02 name
4408	Sheets for veneering
4409	Wood (including strips and friezes for parquet flooring, not assembled)
4410	Particle board and similar board
4411	Fibreboard of wood or other ligneous materials
4412	Plywood, veneered panels and similar laminated wood
4413	Densified wood, in blocks, plates, strips or profile shapes
4414	Wooden frames for paintings, photographs, mirrors or similar objects
4415	Packing cases, boxes, crates, drums and similar packings, of wood
4416	Casks, barrels, vats, tubs and other coopers' products
4417	Tools, tool bodies, tool handles, broom or brush bodies and handles, of wood
4418	Builders' joinery and carpentry of wood
4419	Tableware and kitchenware, of wood
4420	Wood marquetry and inlaid wood
4421	Other articles of wood
9401	Seats (other than those of heading 94.02), whether or not convertible into beds, and parts thereof
9403	Other furniture and parts thereof

Source: Authors' elaboration.

Annex 3. The notion of revealed comparative advantage (RCA)

Based on Balassa (1977), a country *j* is defined as having a comparative advantage in product *k* if the share of this product within the country's export basket is larger than the share of this product in the global market. That is,

$$RCA_{jk} = \frac{X_{jk} \Big/ \sum_{jk} X_{jk}}{\sum_{j} X_{jk} \Big/ \sum_{j} \sum_{k} X_{jk}}$$

Where X_{jk} represents the exported value of good k by country *j*.

Therefore, when RCA_{jk} is greater or equal to 1, country *j* is said to be an effective exporter of product *k*,. By contrast, when $RCA_{jk} < 1$ country *j* is not an effective exporter of product *k*.

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