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Africa Current Issues

Industrial Policy for Upgrading Africa's
Growing Horticultural Industry

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Introduction

Industrialization and manufacturing recently re-emerged in African policy debates, following their inclusion in the 2015 Sustainable Development Goals (SDG 9). This path promises to narrow development gaps among developing and industrialized countries in key areas. These include technological capability, productivity, economic diversity, export competitiveness, per capita income, and formal-sector employment. The trend is especially prominent in sub-Saharan Africa (SSA), where national and regional institutions increasingly promote economic transformation through industrialization (ATR, 2014).¹

Economic transformation through industrialization requires an effective industrial policy. Broadly defined, industrial policy is a set of actions pursued by a government with the explicit goal to promote the expansion, technological upgrading, or international competitiveness of a targeted set of economic activities (Ansu 2013).²

The choice of policy measures depends largely on situational factors. Latin America once focused on import-substituting industrialization (ISI). This required closing domestic markets to international competition. In South Korea and Taiwan, policy relied on incentives to induce development of export industries. Rodrik (2007)³ argues that one size does not fit all. To succeed, industrial policy must take into account the context and institutions of the country.

Countries in Sub-Saharan Africa (SSA) experienced two major industrial policy regimes following independence. In the 1960s, many African countries adopted ISI-centred policies. By the early 1980s, severe balance-of-payments problems made ISI strategies difficult to sustain. Many SSA states turned to the International Monetary Fund (IMF) and the World Bank for help. Their assistance was often contingent on adoption of macroeconomic stabilization programs with the IMF, and structural reform programs with the World Bank. These measures, or "Structural Adjustment Programs" (SAPs), typically shared the following features: reduction of fiscal deficit; devaluation of exchange rates; liberalization of trade (particularly imports); privatization of state-owned enterprises; and reductions in state involvement in production and support to selected economic activities and actors. As with ISI strategies, outcomes from SAPs were disappointing (Ansu 2013).

Calls for African economic transformation coincided with the emergence of a new industrial policy model for state-private sector partnership. This took the form of a set of "market-oriented industrial policies. These promoted the efficient production and export of a diverse range of technologically upgraded goods and services, regardless of sector (Whitfield and Buur 2014).⁴ This new policy sought a balance between state and private sector roles in their active collaboration. A crucial role for the state in such a partnership, in addition to maintaining macroeconomic stability, is to facilitate the private sector's journey toward international competitiveness through (for example) subsidization of firms involved in global value chains.

Manufacturing today relies on Global Value Chains (GVC). Kaplinsky (2000)⁵ defines value chains as "the full range of activities which are required to bring a product or service from conception, through the intermediary phases of production, delivery to final consumers, and final disposal after use." The adjective "global" highlights the contribution of global inter-firm networks to activities that add value. The production of primary products often takes place in less developed countries. The taste and preference of consumers based in developed countries may govern product features. Large retailers and brand-name companies influence global production, distribution, and marketing systems (Gereffi, 1994).⁶

Africa seeks to implement its new industrial policy within this new GVC paradigm. This offers each country the opportunity to specialize in a limited set of tasks suited to its capabilities. However, the GVC

model places a strong premium on trade logistics, an area in which Africa's economies have yet to excel.

New services emerged in those SSA countries where governments moved to overcome high transportation costs and adopt information and communication technology. These services and some agri-business activities share certain characteristics with manufacturing. Page (2020)⁷ calls these "industries without smokestacks" (IWOSS) to distinguish them from traditional industry. Such IWOSS activities are generally:

- Tradable;
- Have high value added per worker—relative to average economy-wide productivity;
- Exhibit the capacity for technological change and productivity growth;
- Show some evidence of scale and/or agglomeration economies; and
- Have the potential to employ large numbers of moderately skilled people.

The horticultural industry, which includes fruit, vegetables, and cut flowers, is an interesting case of a successful IWOSS. This subsector attracted private investors to SSA countries such as Kenya, Ethiopia, Senegal, South Africa, and Cote D'Ivoire. Once efficient global logistics are in place, countries with suitable agro-ecological conditions can produce and export high-value products such as cut flowers and fresh vegetables. These were previously produced only near their point of consumption (Fukase and Martin, 2018).⁸ In SSA, horticulture exports are the latest export success story with an annual value exceeding \$16 billion.

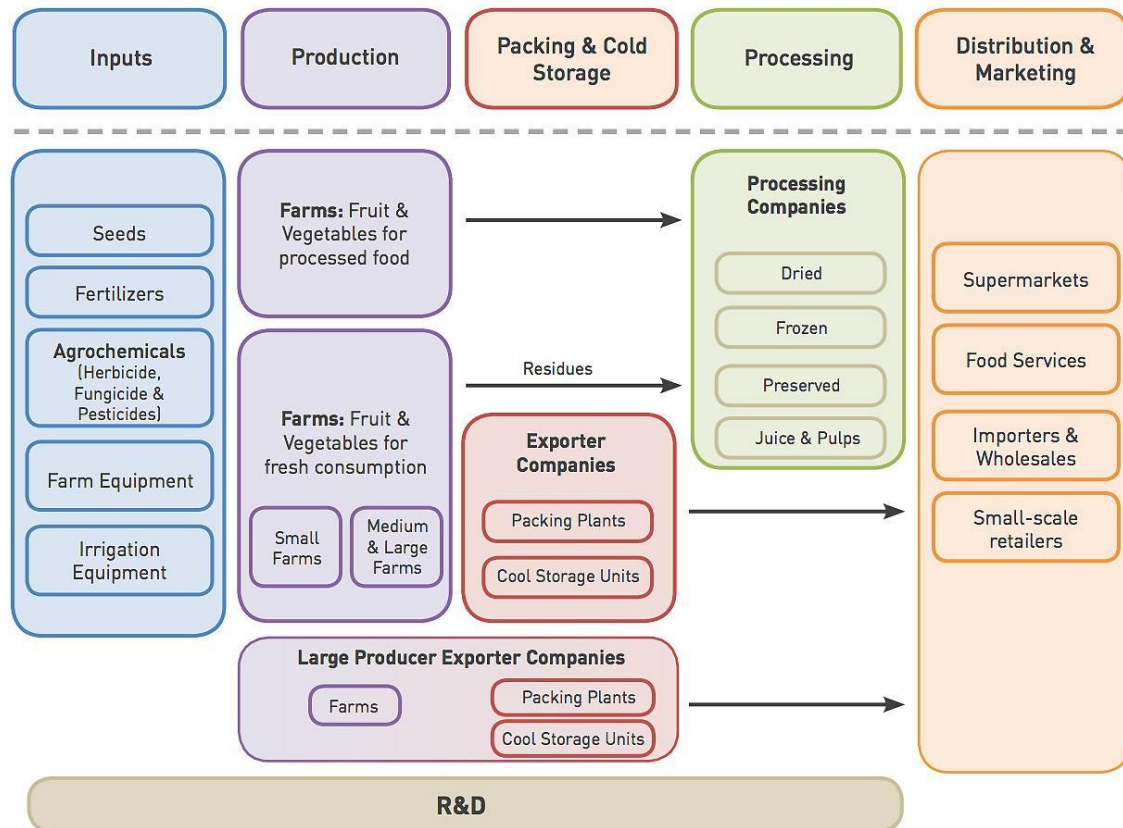
This article first explores the horticultural global value chain. We then examine African horticultural firms and describe the functional capabilities and process requirements of each type of horticultural firm. We close the article with an exploration of how the new industrial policies paradigm might facilitate upgrading African horticultural firms to the GVC.

Horticulture Global Value Chain Structure

Many value-added functions within the horticultural industry shifted from developed to developing countries as the latter acquired intermediate downstream capabilities (Fernandez-Stark et al. 2011). Today, the horticultural industry operates as a buyer-driven value chain (Gereffi & Lee, 2009).⁹

Figure 1, drawn from Fernandez-Stark et al (2011)¹⁰, portrays the notional structure of the horticultural value chain. This value chain spans multiple elements: inputs, production, packing and storage, processing and distribution, and marketing. Industry segments such as Farms and Processing Companies adopt value chains that fit their business models. We discuss the structure of these value chains in detail, below.

Figure 1: Segments in the Horticulture value chain



Source: Fernandez-Stark et al (2011)

The most important inputs for production in this industry are seeds, fertilizers, agrochemicals (herbicides, fungicides and pesticides), farm equipment, and irrigation equipment. Logistics and transportation fulfil key supporting functions, while government regulatory bodies are required to approve the sanitary and phytosanitary conditions of outbound products. The fragile and perishable nature of the product requires a high degree of coordination among the many actors along the chain. This ensures that the perishable product reaches its destination in good condition. Cold storage units are used throughout the chain to keep the produce fresh, and both air and sea freighting supported by the cold chain are key elements to ensure timely delivery.

Following this, the key segment of the value chain for SSA countries, production for export, is divided between production for fresh consumption and production for processed fruit and vegetables. In some cases, the fresh fruit and vegetables that are not accepted for sale as fresh produce are used as inputs for the processing stage. Production is organized in small, medium, and large farms that supply exporter companies and/or producer-exporter companies that own farms, but they may also supplement their supply by buying from other farms. Industry associations often play important supporting roles at this stage in disseminating information about new products, processes and best practices.

The next segment is packing and cold storage. This stage is only undertaken by large producers/exporters or exporting companies. The first stage of the packing segment is grading. Unacceptable low-grade produce will be redirected to processing plants or the domestic market. Washing, trimming, chopping, mixing, packing, and labelling are other processes that may occur in this stage of the value chain. Once the produce is ready for transport, it is blast chilled and placed in cold storage units ready for export. Packing usually requires large volumes due to the high fixed costs of cold storage and other capital investments needed at this stage; thus, large producer-exporter and exporter companies that buy the fresh fruit and vegetables often package, store, and export them.

Processed fruit and vegetables include dried, frozen, and preserved produce, as well as juices and pulps. Many of these processes add value to the raw product by increasing the shelf life of the fruit and vegetables. Processing plants purchase fruits and vegetable inputs from the producers. These firms may export their products under their own brand, as well as under the buyer's brand. The last stage of the value chain before consumption is distribution and marketing. In this final stage, the produce is distributed to buyers through different channels including supermarkets, small-scale retailers, wholesalers, and food services.

Lead firms exert significant influence over the entire value chain. They dictate how horticultural products are produced, harvested, transported, processed, and stored. This control involved the introduction of private standards and codes of conduct that govern both the characteristics of the product including, quality, size, pesticide use, and the social and environmental conditions of cultivation and post-harvest handling (Barrientos et al, 2016).¹¹ Large and small suppliers around the world are required to meet these demands to maintain access to these markets (Dolan and Humphrey, 2004).¹²

Smallholder farmers were until recently excluded from the GVC. Their inability to comply with strict European quality standards prevented them from taking direct roles in the GVC. The recent rise of supermarkets in Africa led to the rise of educated farmers operating at medium scale in markets such as Kenya (Mulangu, 2017).¹³ Barrientos et al (2016) discusses the introduction of producer marketing groups (PMOs) in Kenya and Uganda. PMOs contracted large number of smallholder farmers to aggregate and sort horticultural products on behalf of local supermarkets or exporting companies. The nature, attributes, and long-term impact of these contracts are far from clear. However, economic logic suggests that well-informed farmers would not voluntarily enter into contracts with buyers unless they believe benefits will follow.

Technological Capabilities of African Horticultural Firms

To understand how new industrial policy can help African horticultural firms upgrade the GVC, it is necessary to understand the technological capabilities of horticultural firms. These rely on technical, managerial and organizational skills. These human assets enable efficient use of equipment and technical information (Lall 1993).¹⁴ These capabilities are firm-specific. The skills of its staff members are a collective form of institutional knowledge, accumulated over time. They enable a firm to integrate the educational qualifications of employees, skills and learning acquired on the job, and equipment and hardware into a technological system. This enables the firm to function 'with constant interaction among its members, effective flows of information and decisions, and a synergy that is greater than the sum of individual skills and knowledge' (Lall 1993).

Technological capabilities will vary by the level of GVC deepening for each firm. Deepening is a form of upgrading. The term deepening refers to upgrading the quality or yield of farm outputs through adoption of new technologies, including management practices. We note four level of GVC deepening of industry segments engaged in production and/or export of horticultural product in Africa: (1) small and medium producers selling to exporters; (2) larger producers selling directly to local and regional supermarkets; (3) aggregators/exporting companies; and (4) large producers who export directly (producer-exporters). The complexity of the value chain for each functional category increases depending on the target end markets and channels.

Mulangu (2017) observes seven technology-linked capabilities linked to deepening in horticulture.¹⁵ These capabilities span investment, product, production, harvest & post-harvest processing, logistics, linkages, and end market activities. We explore each of these GVC deepening processes below.

Investment typically begins with site selection. Small and medium producers must first identify a site suitable for production of the desired crops. Next, the prospective producer must carry out a feasibility study of the costs and benefits, taking into account whether the site is to be rented or purchased. These preliminary activities may qualify farmers to secure credit, assuming they have adequate collateral.

Farmers aiming to produce for both local and regional supermarkets must conduct similar activities. However, they must also generate feasibility studies of the risks, costs, and benefits associated with serving domestic and/or regional supermarkets. Few exporting companies invest in primary production activities. However, they must select a site for a packing house and post-harvest activities, secure supply of produce through contractual agreements with medium-sized producers and producer groups, conduct feasibility studies and risk assessments for exporting to the EU, assess hiring and worker training costs, and negotiate contracts with utility providers. Large producer-exporters must undertake pre-investment activities similar both to exporting companies and producers for supermarkets, but at a grander scale.

Products require inputs. Virtually all categories of producers need finance to buy seeds, fertilizers, and agrochemicals. Producers may also secure supplies of cultivars from local seed producing companies, especially to produce annual crops. Exporting companies must establish contractual arrangements with producers and with input providers who serve producers, or with PMOs with which they have contractual arrangements. For large producer-exporters, all of the above tasks apply.

Producing fresh fruits and vegetables requires capabilities all along the agricultural value chain. Workers must be able to till the soil and apply fertilizers, transplant, weed and thin, or prune crops. Harvest requires picking, cleaning, packing, and loading harvested products. Farm workers hired for these activities must have thorough knowledge of agricultural chemicals plus proper application and disposal procedures. Workers in larger scale operations must be able to install, maintain, alter, repair, and service irrigation systems and other equipment. Deepening into production for local and regional supermarkets requires abilities to selectively choose harvest for processing based on quality, size, colour, and maturity.

Exporting companies also must ensure quality and strict respect for supplier standards. They need to control production reliability, improve productivity and comply with safety, labour, and environmental standards. Larger producer-exporters must meet the same requirements as exporting companies, but must also add additional quality control filters such as time of harvest, methods of picking, types of on-farm transportation, and dress codes of farm workers.

To harvest and conduct post-harvest activities, small and medium producers need grading capabilities. At small scale, this can take the form of visual sorting conducted mostly by women. Farmers also need picking and farm transport equipment. Farmers producing for domestic and regional supermarkets need capabilities for washing, trimming, chopping, and mixing. They need a packing manager who will be responsible for the day-to-day pack house operations, including staff management, budgeting and planning. Exporting companies and large producers/exporters may also need to invest in “high care facilities” to process ready-prepared vegetables and salads that meet European hygiene regulations. This requires using chilled chlorinated water for washing, employing a quality assurance manager to ensure that handling of fresh fruits and vegetables meets the health and safety protocols of buyers and export markets, and using computer-controlled equipment to ensure traceability of their produce.

To meet their logistics needs, small and medium farmers must invest in equipment, training, and licenses. They will need utility vehicles to transport fresh fruit and vegetables from their fields and pack houses to aggregators or shippers. To deliver product safely and in good condition they must have capabilities to manage logistics and dispatch paperwork. Producing for domestic and regional supermarkets requires meeting high standards related to logistics, and acquiring heavy trucks and licenses. Exporting companies and large producer-exporters must introduce Just-In-Time management techniques to minimise the delays between harvesting, packing and delivery. They must invest in refrigerated container technology; establish contractual arrangements with (or own if vertically integrated) a freight company to secure cargo space.

Linking with supply chain actors involves networking and managing relationships with stakeholders. Small and medium producers often obtain memberships in professional associations. Producers for

domestic and regional supermarkets need contractual arrangement with freight companies. Large producer-exporters need IT systems to track orders and sales, understand their customer base, organize storage, delivery and transport, contribute to local (where families of workers live) community activities, and organise site visits to maintain buyer confidence.

Depending on their target end markets, small and medium producers must maintain contractual arrangements with aggregators, domestic or regional supermarkets, or exporters. Producers for domestic and regional supermarkets must go the extra step to invest in skills or infrastructure that will enable them to meet the private and public standards of their buyers. They must allocate resources to train personnel in quality and safety practices, and develop monitoring tools and evaluation criteria. Exporting companies face many complex challenges. They must be able to negotiate contracts with European channels and supermarkets. They must also invest in meeting Fair-trade, labour, and industry standards. Maintaining relationships with buyers (communication, negotiations, and audits), managing market and buyer diversification, and gathering market intelligence are mission-critical management tasks. Also, exporters and large producer-exporters must respond to buyer requests for pricing and offer within tight lead times.

How Can Industrial Policies Help African Horticultural Firms Build Capabilities to Deepen the GVC?

Most Sub-Saharan African governments promote investments and exports through public sector agencies. In some cases, one agency performs both functions, as in Rwanda and Botswana. Other countries have separate agencies, as with the Ghana Investment Promotion Centre and Ghana Export Promotion Authority, or the Uganda Export Promotion Board and Uganda Investment Authority. Unfortunately, these agencies receive little priority. Their accomplishments are not publicly honoured, their failures go unpunished, and they are not held to targets. This encourages bureaucratic and passive behaviour. Agencies participate in trade fairs and tend to wait for investors and exporters to come to them. The successful agencies, such as Ireland's Industrial Development Agency and Singapore's Economic Development Board, actively research, identify, and aggressively pursue potential investors and exporters.

SSA countries do use special industrial parks or special economic zones to promote investment and exports. In those parks, they can provide factory shells served by first-rate power, water, and logistics in a localized area. Tenants can partly or fully finance operations. The parks and zones enable the host country to pilot simplified regulations, procedures and customs and other fiscal exemptions. Introducing reforms rapidly on a national scale can be very difficult. Testing new approaches and tailoring services to special needs in the parks and zones may be a path forward.

Horticultural firms that plan to upgrade have specific needs. To help these firms upgrade, industrial policies must go beyond the one-size fit all incentives provided by industrial parks or special economic zones. Industrial policies must target specific levers in the GVC's functional structure. Functional upgrading the value chain in the horticulture industry has a linear nature. Upgrading starts by improving production, moves on to packing, then to processing, and finally to achieve control over distribution and marketing as detailed earlier. Upgrading horticultural production functions relies heavily on government policy incentives that promote non-traditional exports. Countries can begin to offer services in the packing and storage segment of the value chain, to increase their access to key markets and avoid competition from new countries entering the bulk produce market (Jaffee and Masakure, 2005).¹⁶ Upgrading into packing requires understanding market needs, investment in capital goods and the availability of supporting activities and infrastructure within the host country. These include adequate and stable utility supplies and availability of freight services that cater to highly perishable products such as fresh fruits and vegetables. In countries such as Kenya and Ethiopia, freight services have gained high level of efficiency comparable to those in developed countries, thanks to the daily and reliable services of national airline companies.

The move into processing for export requires success in the earlier stages of the value chain. Upgrading processing operations requires adequate year-round supplies of inputs to justify the necessary capital expenditures (Fernandez-Stark et al; 2011). Upgrading at this stage relies on industrial policies that provide access to sophisticated infrastructure, substantial cash reserves to withstand temporary losses in anticipation of future gains, and a workforce prepared to perform manufacturing rather than agricultural tasks.

Functional upgrading often involves capital investment. Deepening and upgrading in the horticultural sector requires workforce development. This will help improve productivity, meet standards, align skills to market needs, diversify products, and innovate in critical areas such as better packing systems. Workforce development initiatives span a wide range of activities. These include a variety of learning modes, such as on-the-job training, off-job classes and short courses, industry training sessions, programs leading to certification, training by buyers, and training by governments, nongovernmental organizations (NGOs), and donor organizations.

Workforce development upgrading creates a wide range of both production and post-harvest jobs that vary in skills and specializations. Increased production has incorporated new labourers into the value chain, while the shift of packing functions to less expensive, developing nation locations has required additional hands in the pack houses to provide washing, cutting, trimming, and mixing procedures (Weinberger & Lumpkin, 2007).¹⁷ The industry draws principally on a young, uneducated and flexible labour force, combined with a very small percentage of skilled labour (Best and Mamic, 2008¹⁸). Formal education is not a required for most positions in low levels of the value chain; typically semi-skilled (e.g., mechanics, sprayers, drivers, etc.) and skilled labour (agronomists, nutritionists, etc.) accounts for 10% or less of the labour force in horticultural operations (Dolan, 2004).¹⁹ Given this, the industry is an attractive source of employment for a large segment of the population whose employment alternatives are limited due to a lack of formal education.

These new industrial policies create additional opportunities for existing and future private sector actors. For example, the smallholder-led nature of primary horticultural production combined with the on-going supermarket revolution in Africa creates new opportunities to expand PMO type activities. By aggregating farmers' outputs, then sorting, cleaning, and professionally packaging local fruits and vegetables to meet strict international standards, PMOs add value and reduce the supermarket's cost of dealing with smallholder farmers. More reliable utility supply, combined with fiscal incentives provided to firms operating in special industrial parks, makes those African countries with reliable transports and logistic infrastructure globally competitive.

To meet their functional upgrading needs, investors will require government support. They should expect African countries' new industrial policies to continue subsidies for utility services, to facilitate access to foreign currencies and to provide cheaper credits through export facilitation agencies. Investors can also expect African governments to partner with donor agencies to support skills development initiatives such as TVET, to ensure an adequate supply of quality workers. Industry-specific industrial policies need support from well-managed core state functions. These include planning and managing public investment, particularly in infrastructure; improving public procurement to increase process transparency and reduce corruption; administering customs, seaport, and airports honestly and efficiently to facilitate trade growth and boost government revenues; and formulating agricultural policy decisions based on data and science.

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