Creating More and Better Jobs in Global Value Chains

Miet MAERTENS\textsuperscript{1}, Anna FABRY\textsuperscript{1}

\textsuperscript{1} Division of Bioeconomics, Department of Earth and Environmental Sciences, KU Leuven, Belgium


Abstract

High-value and fresh produce exports from developing countries have expanded rapidly since the turn of the millennium. In particular, exports of horticultural produce grew exponentially in all developing regions – from less than 5 billion USD in 2000 to 16 billion USD in 2015 in Africa, from slightly over 10 billion to almost 40 billion USD in Latin America, and from about 15 billion to 66 billion USD in developing Asia. Horticultural export expansion has been associated with a process of modernization of food value chains and with agro-industrialization, and with important consequences for rural labor market dynamics and rural development. In this paper we analyze how high-value export growth and global food value chains contribute to rural labor market dynamics and rural development. We put forward a dual economy framework to better understand the labor market and development implications of high-value export expansion and associated agro-industrialization. We rely on a review of the literature and on empirical evidence from three original case-studies of particularly dynamic high-value export sectors: the fruit and vegetable export chain in Senegal, the pineapple export chain in Ghana and the asparagus export chain in Peru. We match the evidence from these case-studies with insights from a dual economy framework to discuss how horticultural export expansion contributes to creating more and better jobs for rapid poverty reduction and rural development. We describe worldwide trends in horticultural export growth and value chain development; employment and wage dynamics in horticultural export regions; and the direct and indirect development effects of these dynamics. Finally, we elaborate on some future perspectives about employment in global value chains, agro-industrialization and labor market dynamics.

Keywords: high-value exports, global value chains, agro-industrialization, rural labor markets, rural development.
Creating More and Better Jobs in Global Value Chains

‘One of the surest ways of increasing the national income is (therefore) to create new sources of employment for women outside the home’ – Arthur W. Lewis (1954), p. 84

1. Introduction

Since the early years 2000, horticultural exports from developing countries increased sharply. Fresh horticulture produce (including fruits, vegetables and cut-flowers) exports from Latin-America more than tripled in the period 2000-2016, while exports from Africa and Asia more than quadrupled. Various developing countries have identified the development and modernization of the horticultural sector as a main strategy for export diversification, increasing foreign exchange earnings, reducing rural poverty and stimulating economic growth. Horticultural exports entail a high potential for contributing to rural income mobility and poverty reduction because of the intensive use of low-skilled labor in production and post-harvest activities combined with a high intrinsic value of produce (Aksoy & Beghin, 2005; Anderson & Martin, 2005; Van den Broeck & Maertens, 2016). Horticultural exports are often referred to as high-value exports because they result in higher and less variable foreign exchange earnings than coffee, cocoa and other traditional commodity exports (Carter et al., 1996; Van den Broeck & Maertens, 2016).

A main issue of concern at early expansion of horticultural exports has been the inclusion of smallholder farmers (Reardon et al., 2009; Swinnen, 2007). High-value export chains have been contested to be exclusive towards vulnerable groups, specifically towards poor farm-households and women farmers, or towards smallholder farmers altogether – and to therefore not realize the potential contribution in rural income growth and poverty reduction (McCullough et al., 2008; Weinberger & Lumpkin, 2007). Some studies show that poorer farm-households (with less land and non-land assets and lower levels of human capital) are excluded from horticultural export chains because export companies, who rely on contract-farming to source fresh produce, prefer to contract with relatively better-off farmers who can assure access to land and labor for export production (Afari-Sefa, 2007; Maertens & Swinnen, 2009; Masakure & Henson, 2005). Dolan (2001) reports that the same holds for women farmers in Kenya, who are completely excluded from contract-farming with vegetable export companies. In the same vein, the spread of private standards in horticultural export chains has resulted in high costs of compliance which cannot be overcome by capital constrained smallholders (Asfaw et al., 2010; Ashraf et al., 2009; Dolan & Humphrey, 2000; Kersting & Wollni, 2012; Narrod et al., 2009; Okello & Swinton, 2007; Supervie & Vagneron, 2013). Various studies report that horticultural export sectors evolve into agro-industrial sectors in which smallholder production is excluded altogether – among other reasons, due to the spread of stringent private standards (Jaffee & Masakure, 2005; Maertens et al., 2011; Reardon et al., 2001; Schuster & Maertens, 2013).

To truly understand the contribution of high-value export expansion to rural development and poverty reduction, a labor market perspective is crucial. Rural households are important suppliers of labor in agro-industrial export sectors (Maertens & Swinnen, 2009; Maertens et al., 2012). Some horticultural export sectors have been documented to include a large amount of hired workers on the fields and the conditioning centers of export companies; e.g. an estimated 85,000 workers in the Ethiopian flower
industry and 100,000 in the Peruvian horticultural export sector (Schuster & Maertens, 2016; Staelens et al., 2014). The quantity and quality of these jobs created in global value chains matter.

In this article we put forward a dual economy framework to better understand the labor market and development implications of high-value export expansion and associated agro-industrialization. We review the empirical literature on labor market effects in high-value export chains and match the evidence against the dual economy framework. We examine in particular three original case-studies of employment in particularly dynamic export sectors: the fruit and vegetable export chain in Senegal, the pineapple export chain in Ghana and the asparagus export chain in Peru. After the description of the theoretical framework and the data in section two, we describe the worldwide trends in horticultural export growth and the associated process of agro-industrialization and value chain modernization in section three. In section four, we describe labor market dynamics in horticultural export regions and focus on ‘more jobs’ and employment dynamics as well as on ‘better jobs’ and wage dynamics and decent work. In a fifth section, we explore the development implications of horticultural export growth and association agro-industrialization and labor market dynamics. We distinguish between direct income and poverty effects, indirect investment effects and gender-related effects. In a final section we conclude and elaborate on some future perspectives about employment in global value chains and agro-industrialization.

2. Methods

2.1. Dual economy framework

We depict an economy that has the dualistic features of the Lewis model (Lewis, 1954) but we particularly consider an agro-industrial sector as the modern or high productivity sector instead of a manufacturing sector. This resembles a situation of expansion of high-value exports, which is associated with a process of agro-industrialization in rural areas (see section 3). The traditional or low productivity sector in the economy is a small-scale informal sector that includes smallholder farming as well as small-scale rural non-farm businesses. While the original Lewis model (1954, 1979) and recent reinterpretations, revisions and extensions (Diao and McMillan, 2018; Wang and Piesse, 2013; Diao et al., 2018) put emphasis on industrialization, structural transformation, rural-urban migration and urban employment dynamics; our model focuses on agro-industrialization, agricultural transformation, rural-rural migration and agricultural or rural employment dynamics.

The traditional smallholder sector is depicted in the right panel of figure 1. As in the original Lewis model, this sector is a low productivity domestic sector with surplus labor. Smallholder farmers earn their average product of labor in the sector APL, which could also resemble a subsistence wage or income w0. This is determined by the agricultural production function TP, and the total labor force in the sector L0.

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1 The modeling framework builds on the original and seminal work of Lewis (1954, 1979) and recent reinterpretations, revisions and extensions of the original Lewis two sector model by Diao and McMillan (2018), Wang and Piesse (2013), and Diao, McMillan and Wangwe (2018).

2 Lewis (1979) and Diao and McMillan (2018) particularly distinguish between the traditional smallholder farm sector and an in-between sector including small- and medium-scale non-farm enterprises. This distinction is not necessary for the purpose of this paper (explaining the labor market dynamics and development implications of the growth in high-value export chains) and would unnecessarily complicate the model.
initially equaling the total rural population. As in the reinterpretation of the Lewis model by Wang and Piesse (2013), two types of surplus labor can be distinguished: absolute surplus labor for which the marginal product of labor MPL is zero (L0 - L1 in figure 1) and relative surplus labor for which the marginal product of labor MPL is positive but smaller than w0 (L1 - L2 in figure 1). The first type of surplus labor can be withdrawn from the sector without consequences for TP (and corresponds to unemployment or unutilized labor) while withdrawal of the second type of surplus labor marginally reduces TP (which corresponds to underemployment or underutilized labor). Whether or not the withdrawal of absolute and/or relative surplus labor from the sector increases the wage or income level beyond w0 depends on the extent to which population growth and rural migration replenish labor in the traditional economy and compensate for the labor outflow.

The modern agro-industrial high-value export sector is depicted in the left panel of figure 2. This is a high-productivity agro-industrial export sector with total output TPm. The modern sector withdraws labor from the traditional sector and creates profits, resulting in capital accumulation, production at a higher TPm function and expansion of the sector. Entrance of the modern sector in the traditional rural economy – in our case because of an expansion of high-value exports and associated agro-industrialization – creates labor market dynamics in the rural economy. In line with Wang and Piesse (2013), we identify three stages in this process. In stage I, there is absolute surplus labor and MPL is zero. The agro-industry wage w is above the initial above the initial subsistence wage in the traditional sector w0. The wage w can be determined by a market mechanism in which case w = w0 μ with 0 < μ < 1 the probability of access to a formal job in the agro-industry. Alternatively, the wage w can be determined by institutions such as a legal minimum wage or private standards stipulating a minimum or living wage. The latter is likely in the case of high-value export sectors (see section 3) and results in labor market segmentation. This results in a horizontal labor supply curve S in the modern sector with constant wages w. Because of the elastic labor supply curve S in the agro-industrial sector are high (reflected by the area between the MPL curve and the labor supply curve S in figure 1). This leads to rapid capital accumulation and expansion of the agro-industry as well as to rapid employment expansion in the sector. In stage II, the absolute surplus labor in the smallholder economy has been exhausted but there is relative surplus labor for which the marginal productivity is positive but does not reach w0: 0 < MPL < w0. Withdrawal of labor from the smallholder sector is no longer unlimited and needs to be compensated for with productivity increases in the smallholder sector for domestic output TP not to drop. As a result, wages in the agro-industry will start to increase and profits will start to shrink. Ultimately in stage III, also relative surplus labor has been exhausted and MPL approaches w0. The agro-industrial sector and the smallholder sector will start to compete for labor, which drives up real wages in both sectors. Profits in the agro-industry decrease further. The economy is no longer dualistic with labor market segmentation and can be modelled as a one sector neo-classical economy.

The labor market dynamics and ultimately the rural development implications of the entry of a high-value export agro-industry in a traditional rural economy, is determined by the speed of transition from stage I to stage II and III. In stage I, that part of the rural labor force with access to formal jobs in the agro-industry experiences an increase in real wages and incomes. There is a rapid expansion of the agro-industrial sector and large profits from which mainly investors – which are often foreign investors (see section 3) – benefit. The duality leads to rapid economic growth through a transfer of labor from a sector with zero MPL to a more productive sector. In stage II real wages of agro-industry workers start to increase while in stage III the large part of the population, irrespective of the sector they are employed in, enjoys
increased real wages and incomes. Shrinking agro-industrial profits in stage II and III may slowdown the expansion of the agro-industry sector and employment creation in the sector – or even result in a relocation of the agro-industry to other regions or countries, which is especially likely in the case of FDI companies, as is the case in many high-value export sectors (see section 3). While stage I is associated with rapid formal employment creation in the agro-industry (more jobs), stage II and III are associated with improvements in wages and other employment conditions (better jobs). The speed of transition between the different stages determines employment and wage dynamics (or the trade-off between more and better jobs) in the rural economy, and ultimately the process of rural development.

The speed of transition between the different stages crucially depends on a number of factors. First, the existence of surplus labor in the traditional economy is important. Unemployment and underemployment in rural areas of developing countries are widely documented and have been linked to gender imbalances (McCullough, 2017). If the extent of un- and under-employment is relatively higher among rural women, then an agro-industrial sector that can attract and intensively use female labor will contribute more importantly to rapid growth (and more jobs) by exploiting surplus labor. Second, rural population growth and rural migration replace labor withdrawn from the smallholder sector and thereby determine the speed with which absolute and relative surplus labor become exhausted. If agro-industrial expansion is slow, withdrawal of labor from the smallholder sector might be compensated for through population growth and rural migration. If agro-industrial expansion is rapid – as has been the case in many horticultural export sectors (see section 3) – population growth and rural migration might not keep pace with labor withdrawal from the smallholder sector, resulting in a more rapid transition to stage II and III.

Third, productivity increases in the smallholder sector can occur through technical innovations in smallholder farming and expansion of non-farm businesses. Such productivity increases represent an increase in $TP_t$, $APL_t$ and $MPL_t$ and are important in stage II. On the one hand, a smallholder productivity increase leads to an increase in (relative) surplus labor (i.e. it increases underemployment) and thereby eases the outflow of labor to the agro-industry and expansion of that sector. On the other hand, this increases the productivity of labor in the smallholder sector, and hence wages in that sector, and accelerates the transition from stage II to stage III with a competitive labor market and high wages. Especially in the case of rural agro-industrial development (rather than urban manufacturing, as in previous versions of the Lewis model), productivity increases in the smallholder sector are likely. Proximity between the agro-industry and the smallholder (farm and non-farm) sector increases the likelihood of technical and managerial spillover effects, the likelihood of investment linkages (i.e. wages from the agro-industry being invested in smallholder farm and non-farm businesses) and consumption linkages. The latter occurs when agro-industrial wages and incomes add to the purchasing power of agro-industry workers, and thereby increase the demand for locally produced food and non-food products and services, and the price of these products and services.

A final note is that wages do not necessarily only include monetary compensation. The wage factors $w_t$ and $w_m$ can also be thought of as a package of employment conditions, including the wage but also non-monetary features such as complementary services, treatment at the workplace, employment security and safety.

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3 The original Lewis model (Lewis, 1954) does not consider productivity increases in the traditional sector but recent reinterpretations and revisions of the model do (e.g. Wang and Piesse, 2013).
2.2. Data

This paper relies on secondary data from external sources, such as FAOstat and Comtrade, to document the importance of horticultural export growth in various developing regions and countries, and a review of the scientific literature to document and discuss the developments in horticultural value chains, the labor market dynamics created through horticultural export chains, and the development implications of these processes. We specifically rely on insights from three case-studies on horticultural exports in Senegal and Peru, and pineapple exports in Ghana. We use data from various rounds of data collection, including data from semi-structured interviews with export companies and various stakeholders in export supply chains and data from quantitative structured surveys with farm-households in horticultural regions and with workers in horticultural export companies. The latter includes three panel rounds of a farm-household survey in the Niayes region in Senegal (2005, 2007 & 2010), three rounds of a farm-household survey in the Senegal River Delta region in Senegal (2006, 2010 & 2016), two rounds of a worker survey in the Ica and the La Libertad region in Peru (2013 & 2014), and one round of a worker survey in the pineapple belt in Ghana (year). We use these data, evidence based on these data and reported in various articles\(^4\), and the above outlined dual economy framework to document the labor market and development implications of the growth in high-value exports.

3. High-value export growth and agro-industrialization

3.1. A horticultural export boom

In all developing regions, horticultural exports increased substantially during the past two decades, with the most sharp increase since the turn of the millennium (figure 2). In the late 1990s, low- and middle-income countries in Asia exported around 22 million tons of horticulture produce, worth around 15 billion USD. This increased to a volume of 55 million tons and a value of almost 80 billion USD in 2017. In Latin-America, the growth was less pronounced, but still exports of horticultural produce increased from around 20 million ton or 15 billion USD in the late 1990s to 45 million ton and almost 45 billion USD in 2017. While exports of horticultural products from Africa were very low in the late 1990s, by 2017 African countries exported more than 10 million ton of horticultural produce, worth almost 20 billion USD.

As a result of this rapid export expansion, horticultural produce has become the main agri-food export category, surpassing more traditional tropical commodity exports such as coffee, cocoa and tea, in all developing regions (Van den Broeck & Maertens, 2016). From UNCTAD statistics (accessed February 2019), we reveal that in 2017 horticultural exports constitute 26% of total agri-food exports in Latin-America, 27% in Asia, and 33% in Africa. In some individual countries, e.g. in Mexico, Philippines and Egypt, horticultural exports account for more than half of total agri-food exports (Table 1). Apart from these

three countries, main horticultural exporters include Peru, Chile and Ecuador in Latin America; China, Vietnam and Thailand in Asia; and Morocco, South-Africa and Ethiopia in Africa (Table 1).

Table 1: Share of horticultural exports in total agri-food exports (2017). Data for Latin America, Asia and Africa and the top 5 (6) horticultural exporters in these regions.

<table>
<thead>
<tr>
<th>Region</th>
<th>2017 Export</th>
<th>Country</th>
<th>2017 Export</th>
<th>Country</th>
<th>2017 Export</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td>26 %</td>
<td>Asia</td>
<td>27 %</td>
<td>Africa</td>
<td>34 %</td>
</tr>
<tr>
<td>Mexico</td>
<td>58 %</td>
<td>Philippines</td>
<td>56 %</td>
<td>Egypt</td>
<td>67 %</td>
</tr>
<tr>
<td>Peru</td>
<td>45 %</td>
<td>China</td>
<td>40 %</td>
<td>Morocco</td>
<td>48 %</td>
</tr>
<tr>
<td>Chile</td>
<td>45 %</td>
<td>Viet Nam</td>
<td>26 %</td>
<td>South Africa</td>
<td>54 %</td>
</tr>
<tr>
<td>Ecuador</td>
<td>39 %</td>
<td>Thailand</td>
<td>21 %</td>
<td>Ethiopia</td>
<td>34 %</td>
</tr>
<tr>
<td>Brazil</td>
<td>7 %</td>
<td>India</td>
<td>13 %</td>
<td>Senegal</td>
<td>18 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ghana</td>
<td></td>
<td>Ghana</td>
<td>16 %</td>
</tr>
</tbody>
</table>

Source: constructed based on data obtained from UNCTAD database (access February 2019)

A more detailed view on the case-study countries reveals that in Peru and Senegal, horticultural exports have expanded rapidly and continuously since the late 1990s and early years 2000 (Figure 3). The horticultural export sector amounts to 2.8 billion USD and 0.8 billion USD in 2016 in respectively Senegal and Peru. In both countries, also product variety increased steadily with export growth. Peru mainly exported processed fruits and vegetables in the late 1990s but became an important exporter of asparagus, grapes, avocados and tropical fruits such as mango. The horticultural export boom in Senegal started with exports of beans, tomatoes and mango in the early years 2000 but has expanded to watermelon and a variety of fresh vegetables. Ghana shows a more erratic pattern of horticultural export growth (Figure 3). Exports increased in the period 2000 to 2007 but decreased to a pre-2000 level between 2008 and 2013 to then sharply increase again in the most recent years. The main export crop is pineapple for which the export value fluctuates sharply. Recently, also exports of banana and mango became important.
3.2. Trends in horticultural export chains

The increased trade in horticultural produce has been associated with specific developments in the export value chains of these products. This includes increased foreign direct investment in horticultural production and processing; vertical coordination and agro-industrialization; and the spread of private sustainability standards (Maertens & Swinnen, 2007; McCullough et al., 2008; Mergenthaler et al., 2009; Reardon, 2015; Swinnen, 2007; Weinberger & Lumpkin, 2007). First, a large share of the growth in horticultural exports is realized through foreign direct investment (FDI). Various developing countries with an identified comparative advantage in horticultural exports, have followed an active policy of attracting FDI specifically in the horticultural sector; e.g. in Senegal (Maertens et al., 2011), Ethiopia (Dube et al., 2018), in Ghana (Amanor, 2012). The horticultural export sector in Senegal includes some 25 export companies, of which the large majority are established through FDI. In Ghana, 15 companies are producing, processing and/or exporting pineapples, of which 7 are FDI companies (Krumbiegel et al., 2018). The Peruvian horticultural export sector includes some 100 companies, of which about 40% are FDI companies (Schuster & Maertens, 2013). These investments sometimes include land-lease deals with multinational companies for horticultural production, processing and export – although extremely large land-lease deals of more than 1000 hectares are rarely observed in the sector.

Second, the degree of vertical coordination in horticultural export chains is usually high. In many countries and regions, a rather drastic change has been observed in the sourcing strategies of horticultural export companies. This entails a shift from relying on contract-farming with small- and medium-scale farmers to complete vertically-integrated agro-industrial production by the export companies themselves on leased-in land. This shift has been very apparent in the three case-study countries. For Senegal, it has
been estimated that bean export production was for 95% realized by smallholders based on contract-farming in the early years 2000s while this decreased to 29% by 2018 (Table 2). For Peru, it has been estimated that asparagus export companies were sourcing about 60% of produce from small- and medium-scale farms in the late 1990s while this decreased to 35% by 2011 (Schuster and Maertens, 2013). In Ghana, almost half of the pineapple export production was realized by smallholders up to 2006 while in recent years more than 95% of export production is realized by 15 large-scale producer-exporters (Amanor, 2012; Krumbiegel et al., 2018). One of the main driving forces of this shift is the spread of private standards in the sector (see further below). This has been described for Senegal, where horticultural export companies specifically stated to have changed their sourcing strategy in order to become GlobalGAP certified (Maertens & Swinnen, 2009). The causal impact of private standards on sourcing from smallholders has been established for the asparagus export sector in Peru (Schuster & Maertens, 2013). Yet, in the Ghanaian pineapple sector it was the introduction of a new variety – MD2 with a longer shelf life but with a higher requirements for fertilizer, pesticide and cooling facilities – that has caused the shift to more capital-intensive agro-industrial production (Amanor, 2012; Krumbiegel et al., 2018).

Also in other Latin-American and African countries, a similar shift from smallholder contract-farming to vertically integrated agro-industrial production is observed in horticultural export sectors; e.g. in the Kenya horticultural export sector smallholder production decreased from 50% in 2002 to 20% in 2016 (Peter et al., 2018); the Ethiopian flower industry is completely based on large-scale production (Suzuki et al., 2018); and only 33% of export broccoli in Ecuador is soured from smallholders (Granja & Wollni, 2018). In Asian countries, this shift is less pronounced and the main fruit and vegetable export sectors are largely smallholder based – e.g. the apple export sector in China relies for 88% on smallholder production (Miyata et al., 2009) and 75% of export mango producers in the Philippines are smallholders (FAO, 2013). This likely relates to the limited availability of land for expanding production at an agro-industrial scale in these countries. The process of agro-industrialization associated with the expansion of horticultural export sectors in African and Latin-American countries has important labor market effects in these regions.

Third, public and private food standards have become more important. In high-income destination countries, public food safety regulation for fresh fruits and vegetables has become more stringent (Beghin et al., 2015). In addition, private food standards focusing on food quality and safety, or social and environmental aspects of food production and trade have spread in horticultural sectors. The GlobalGAP standard is one of the most important private standards in the fresh produce sector, with worldwide more than 180 thousand certified fruit and vegetable producers. Especially in Africa, GlobalGAP certification is rapidly increasing and has almost doubled over just two years, from an estimated 17 thousand producers in 2015 to more than 30 thousand producers in 2017. In our case-study countries, nearly all exporter-producers are GlobalGAP certified: 95% of horticultural export companies in Senegal, 88% of asparagus exporters in Peru and all 15 pineapple exporters in Ghana. Other private standards, such as Fairtrade, Tesco, SQF (Safe Quality Food) and IFS (International Featured Standards) play a role as well in horticultural export sectors but are less widely adopted than GlobalGAP.

These supply chain developments are well documented in the three case-study countries and summarized in table 2.
Table 2: Characteristics of the Peruvian, Senegalese and Ghanaian horticultural export supply chain.

<table>
<thead>
<tr>
<th></th>
<th>Peru horticulture</th>
<th>Senegal horticulture</th>
<th>Ghana pineapple</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of produce sourced from smallholders</td>
<td>Green beans 60% (1990’s)</td>
<td>Asparagus 95% (2000)</td>
<td>Pineapple 45% (2006)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22% (2018)</td>
<td></td>
</tr>
<tr>
<td>Number of export companies (approx.)</td>
<td>100</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>Average size of exporter-producer companies</td>
<td>380 ha</td>
<td>33%</td>
<td>270 ha</td>
</tr>
<tr>
<td>Average share of FDI</td>
<td>40%</td>
<td>33%</td>
<td>47%</td>
</tr>
<tr>
<td>Share of GlobalGAP certified companies</td>
<td>88%</td>
<td>95%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Derived from own interview and survey data; Fernandez-stark et al. (2016); Krumbiegel et al (2018); Maertens and Swinnen (2009); Schuster and Maertens (2013)

4. Labor market dynamics

Horticultural export growth and associated processes of modernization and agro-industrialization have resulted in labor market dynamics that can be interpreted in the above depicted dual economy framework.

4.1. More jobs: employment dynamics

The very rapid expansion of horticultural exports and associated agro-industrialization in various countries and regions, has directly boosted formal rural employment opportunities in agro-industrial export sectors in producing regions. The shift from smallholder contract-farming to agro-industrial production, described above, has been associated with a shift from family labor and informal employment in to hired labor and formal employment in horticultural export sectors. In addition, the use of stringent public and private standards has increased the need for labor-intensive post-harvest handling of produce (e.g. for washing, sorting, packing and labeling), which further increased employment creation in the export agro-industry. In line with the dual economy framework, rapidly expanding formal employment opportunities in agro-industrial export sectors resulted in large transfers of labor from a low productive smallholder sector to a higher productive modern agro-industrial sector.

Table 3 illustrates the extent of employment creation in various horticultural export sectors in selected countries, including the three case-study sectors. The pineapple export sector in Ghana employs an estimated 3,450 employees in the 15 producer-exporter companies. In Senegal, formal employment in the horticultural export agro-industry increased from around 15,000 employees in 2006 to an estimated 27,200 employees in 2018. Employment in the asparagus and grape export agro-industry in Peru amounts to 100,000 workers in 2013 and 210,000 workers in 2015 respectively. Until 2004, the Peruvian asparagus export sector was organized mainly with family labor on smallholder farms but export growth after 2004 was mainly associated with an expansion of hired labor in agro-industries while the number of family laborers in the smallholder sector remaining stable around 30,000 workers throughout the period 2004-2013 (Schuster & Maertens, 2016). Also in other horticultural export sectors employment creation has
been very substantial with for example 200,000 workers in the Ethiopian cut-flower agro-industry and 700,000 workers in the fruit export agro-industry in Chile.

### Table 3: Employment in the horticultural export agro-industry in selected sectors and countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Sector</th>
<th>Year</th>
<th>Approximate number of employees</th>
<th>Share of female employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senegal</td>
<td>Horticulture</td>
<td>2018</td>
<td>27,200</td>
<td>57 %</td>
</tr>
<tr>
<td>Ghana</td>
<td>Pineapples</td>
<td>2015</td>
<td>3,450</td>
<td>62 %</td>
</tr>
<tr>
<td>Kenya</td>
<td>Green beans</td>
<td>2011</td>
<td>100,000</td>
<td>75 %</td>
</tr>
<tr>
<td>Zambia</td>
<td>Horticulture</td>
<td>2010</td>
<td>10,000</td>
<td>65 %</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Cut flowers</td>
<td>2013</td>
<td>200,000</td>
<td>80 %</td>
</tr>
<tr>
<td>Peru</td>
<td>Asparagus</td>
<td>2013</td>
<td>100,000</td>
<td>50 %</td>
</tr>
<tr>
<td>Grapes</td>
<td></td>
<td>2015</td>
<td>210,000</td>
<td>40 %</td>
</tr>
<tr>
<td>Chile</td>
<td>Fruits</td>
<td>2000</td>
<td>94,000</td>
<td>11 %</td>
</tr>
<tr>
<td>Mexico</td>
<td>Horticulture</td>
<td>2018</td>
<td>200,000</td>
<td>80 %</td>
</tr>
</tbody>
</table>

*Source: Derived from own interview and survey data; Barrientos (2016); Dolan and Sutherland (2002); Evers et al., (2014); Fernandez-stark et al. (2016); Krishnan (2018); Prina (2015); Sipangule and Lay (2015); Suzuki et al. (2018); Wilkinson and Rocha (2009), Zloniski (2018).*

Employment in horticultural export agro-industries is inclusive towards more vulnerable groups in rural societies. Available evidence from the three case-study countries suggests that this employment is accessible for poorer people, unskilled laborers and female workers. In the asparagus sector in Peru, the large majority (more than 90%) of workers are unskilled workers and about 50% of these unskilled workers are women (Schuster & Maertens, 2016). Evidence from the horticultural export sector in Senegal shows that employment in agro-industrial companies includes workers from relatively poorer households with less land and non-land assets and with a lower level of education (Maertens et al., 2011; Maertens & Swinnen, 2009). An estimated 57% of employees in the sector are women (Table 3) and the large majority of these women (65%) have no formal education at all (Van den Broeck & Maertens, 2017). Krumbiegel et al (2018) report that in the pineapple agro-industry in Ghana, 62% of workers are women and that packing and post-harvest handling in conditions centers is mostly done by women while men dominate more technical jobs and on-field chemical application. Also in other countries in Africa and Latin-America, horticultural export sectors are observed to employ a large amount of women; e.g. 75% and 80% of employees in respectively the Kenyan and the Ethiopian floriculture agro-industry are women (Table 3). In addition to being inclusive towards poorer households and women, horticultural agro-industries are observed to employ quite some young people and to attract migrant workers from poverty- and unemployment-struck regions. This is described for the Peruvian horticultural export sector, where an estimated 45% of employees in the coastal agro-industry are migrants from other regions in Peru, especially from Andean regions (Schuster & Maertens, 2016 & 2017). For Senegal we estimate based on interviews with horticultural export companies, that 43% of workers in the horticultural agro-industry are below the age of 25 and that 5% are migrants from other rural areas in Senegal. For other sectors and countries quantitative data on this is still lacking.
These observations are in line with the dual economy framework and the transfer of surplus labor with a low or close to zero marginal productivity in the smallholder sector to the agro-industrial sector. Women, youth, migrant and poor workers are more likely to be un- or under-employed in the smallholder sector, resulting in a lower marginal productivity and a lower reservation wage. Other socio-cultural factors likely play a role as well in the transfer of women and rural migrants to formal agro-industrial employment. For example, Van den Broeck & Maertens (2017) observe that ethnicity and age are determining factors for women to enter agro-industrial employment. The transfer of labor from the smallholder sector to a rural agro-industrial sector is likely more easy than a transfer of labor to an urban manufacturing sector (as in the original Lewis model) because of proximity between the two sectors. Especially for women this proximity might play an important role, which explains the large inflow of female laborers in the horticulture export agro-industry.

4.2. Better jobs: wage dynamics and decent work

The process of growth and agro-industrialization in horticultural export sectors resulted in substantial employment dynamics. Some refer to the shift from family labor and informal labor arrangements in the smallholder sector to hired labor and more formal labor market arrangements in the agro-industrial sector as a change from independent self-employed farmers to subordinate hired workers. Others refer to this as an expansion of promising rural labor market opportunities (Maertens et al., 2011), and in line with the dual economy framework, a shift from low productive to high productive jobs. Which idea is most appropriate strongly depends on wage dynamics and the quality of agro-industrial employment. To document the quality of employment in horticultural export chains, we rely on the ILO concept of decent work, which relates to the following employment characteristics and conditions: productive work and adequate earnings, decent working hours, stability and security of work, fair treatment in employment, safe work, social protection, balancing of work and family life (Anker et al., 2002).

First, horticultural products are often described as high-value products with a relatively high value per weight or per unit. This is in contrast with more traditional tropical commodity sectors, in which raw material (coffee, cocoa, etc.) is exported to be processed in importing countries. Horticultural products are mostly exported as final products that are sorted, packed and labeled; and ready for supermarket shelves in high-income destination countries. This means that the lion’s share of added-value remains in the country of origin. The high-value of produce combined with labor-intensive production and value-adding implies that the return to (unskilled) labor in the sector is relatively high. If wages would be determined in a competitive neo-classical market, this high return to labor would result in upward pressure on wages paid to unskilled workers. Yet, in a dual economy structure where agro-industrial wages are determined institutional – as described above – this is not necessarily the case.

Agro-industrial wages in horticultural export sectors strongly vary with the income level of the country: average wages for unskilled workers vary from 9.67 Ghanaian cedi (1.76 Euro) per day in the Ghana pineapple sector in 2015 to 2,622 FCFA (or 4 Euro) per day in the Senegalese horticultural sector in 2018, and to 38.37 PEN (or 10 Euro) per day in the Peruvian horticultural sector in 2013 (derived from own data and from Krumbiegel et al., 2018; Schuster & Maertens, 2016). For Senegal, Maertens et al.
(2012) report that wages in the horticultural export agro-industry are substantially higher than in other formal rural employment sectors. Also, Mano et al. (2011) indicate that employment in the cut-flower industry in Ethiopia results in higher wages than in other agricultural sectors. On the other hand, studies on the tomato export industry in Mexico (Barron and Rello, 2000), the lemon export sector in Argentina (Ortiz and Aparicio, 2007), and the cut-flower export sector in Colombia (Patel-Campillo, 2010) report that wages in these sectors are particularly low. In addition, despite the sharp growth in exports and the associated increase in demand for hired labor, real wages in the export sectors hardly increase. This is reported e.g. for the Colombian cut-flower industry (Patel-Campillo, 2010). The wage dynamics in the Senegalese horticultural export industry are particularly interesting (Table 4). During the early stage of horticultural export expansion (2003-2013), nominal wages only increased slightly while real wages dropped. Only in more recent years, real wages started to increase – with an increase of 12% in the real wage of casual employees in the period 2013 - 2018. This is in line with the dual economy framework and a transition from stage I with rapid horticultural export expansion and employment dynamics at constant agro-industry wages to stage II with increasing wages and a decelerating growth in the agro-industry in Senegal around 2013.

Table 4: Wage dynamics in the horticultural agro-industry in Senegal

<table>
<thead>
<tr>
<th>Year of observation</th>
<th>2003</th>
<th>2006</th>
<th>2013</th>
<th>2016</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average nominal wages (FCFA / day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All employees</td>
<td>2,537</td>
<td>2,550</td>
<td>2,750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual employees</td>
<td>2,240</td>
<td>2,423</td>
<td>2,620</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent employees</td>
<td>3,484</td>
<td>3,748</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average real wages (FCFA /day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All employees</td>
<td>2,537</td>
<td>2,443</td>
<td>2,239</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual employees</td>
<td>1,824</td>
<td>1,975</td>
<td>2,044</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent employees</td>
<td>2,837</td>
<td>3,055</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Months employed per year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual employees</td>
<td>6.8</td>
<td>6.96</td>
<td>7.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual contracts</td>
<td>85%</td>
<td>88%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent contracts</td>
<td>15%</td>
<td>12%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Derived from own interview and survey data; Van den Broeck et al. (2017); Van Hoyweghen et al (2018). Nominal wages were converted to real 2003 wages using consumer price index data from the IMF.

Second, dynamics in non-wage conditions matter as well from a decent work perspective. In all the three case-study sectors, we observe that daily working hours are around 8 hours on average. Unskilled workers in the horticultural sectors in Senegal and Peru are observed to work only on average around 7 months per year while workers in the pineapple sector in Ghana are mostly employed year round. In the same vein, the large majority (85 to 90%) of unskilled workers in Senegal and Peru are casual workers working on a day-to-day basis or a seasonal contract while in Ghana the majority of workers (70%) do have a permanent contract. In Senegal, we observe that the average employment period of temporary workers has slightly increased but casual employment remains dominant (table 4). Concerning fair treatment, the presence of gender discrimination in the agro-industry has been documented for Senegal: women are more often employed in piecework and in casual jobs, have shorter employment periods and slightly higher daily working hours but there is no evidence of direct gender wage discrimination.
In Senegal and Ghana, some horticultural export companies provide complementary services to their workers, such as on-site access to medical care (either for the worker only or for the entire worker's household), transportation between the village and the company, or financial assistance in case of a funeral. Concerning social protection, agro-industry workers in Peru are protected by the Agrarian Labor Regime, according to which workers should at least receive the minimum wage of 750 PEN per month, have the right to 15 days of holidays per year, should be paid an extra 25% for overtime work, are entitled to social security and pension, etc. (Schuster & Maertens, 2017). It is not completely clear to what extent these labor stipulations are adhered to by the companies — it is e.g. observed that 23% of youth employees in the sector do not receive the minimum wage (Schuster & Maertens, 2016). Only 4% of the horticultural export companies in Peru have a labor union that protects the rights of workers (Schuster & Maertens, 2017).

Table 5: Employment characteristics in certified and non-certified agro-industrial companies in Ghana, Senegal and Peru.

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Item</th>
<th>Wage</th>
<th>Period of employment</th>
<th>Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peru</td>
<td>2013</td>
<td>Certified to labor standards*</td>
<td>4.74 PEN per hour</td>
<td>± 85 days</td>
<td>93% written contract</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not certified to labor standards</td>
<td>4.58 PEN per hour</td>
<td>± 70 days</td>
<td>33% written contract</td>
</tr>
<tr>
<td>Senegal</td>
<td>2010</td>
<td>GlobalGAP certified</td>
<td>1,940 FCFA per day</td>
<td>± 100 days (beans) ± 60 days (mango) ± 75 days (beans) ± 45 days (mango)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not GlobalGAP certified</td>
<td>1,638 FCFA per day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghana</td>
<td>2015</td>
<td>Fairtrade certified</td>
<td>10.10 Ghanaian Cedi per day</td>
<td>244 days</td>
<td>87% permanent contract</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not Fairtrade certified</td>
<td>9.22 Ghanaian Cedi per day</td>
<td>244 days</td>
<td>53% permanent contract</td>
</tr>
</tbody>
</table>

*Labor standards refer to standards with codes of conduct that focus primarily on ILO core workers' rights and good employment conditions, and include ETI (Ethical Trade Initiative), BSCI (Business Social Compliance Initiative), For Life, Fairtrade, Rainforest Alliance, SA8000 (Social Accountability 8000) and ABE (Amcham) certification (Schuster and Maertens, 2016).

Source: Schuster & Maertens (2016); Krumbiegel et al. (2018); Krumbiegel et al. (2017); Colen et al (2012)

Private standards have been discussed as a potential driving force of improved employment conditions and evidence from the three case-study countries confirms this. While some private food standards specifically focus on ethical and labor issues (such as Ethical Trading Initiative and Fairtrade), most standards include at least some specifications on labor issues – even those that primarily focus on environmental issues (such as Rainforest Alliance) or good agricultural practices (such as GlobalGAP)5. In table 5, we summarize evidence on employment characteristics of workers in certified and in non-certified agro-industrial companies in the three case study countries. From these figures, we observe slightly higher

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5 See Schuster and Maertens (2016) for a classification of private standards into labor standard (with a core focus on good employment conditions), quasi labor standards (with some focus on workers' wellbeing) and general standards (without any focus on employment conditions or worker wellbeing).
average wages for workers in companies certified to labor standards in Peru, in GlobalGAP certified companies in Senegal and in Fairtrade certified companies in Ghana compared to companies without such a certificate; and a somewhat longer employment period in companies certified to labor standards in Peru and in GlobalGAP certified companies in Senegal. In Peru, the share of workers receiving at least the minimum wage is higher in companies certified to labor standards (85%) than in other companies (73%). Workers in certified companies are also more likely to have a written or permanent contract. In addition to this descriptive evidence, Colen et al. (2013) estimate the causal effect of GlobalGAP certification on wages and the length of employment in Senegal and find significant positive effects. Schuster and Maertens (2016 & 2017) estimate the effect of certification to labor standards on workers’ employment conditions in a more causal way and find a positive effect on the likelihood to receive the minimum wage (but on the wage level), to have a written contract and to receive training. In addition, for Peru and Ghana it has been documented that certification to labor standards and to Fairtrade standards respectively improve the empowerment of workers in the agro-industry (Krumbiegel et al., 2017; Schuster & Maertens, 2016).

The spread of private standards in horticultural sectors has contributed to creating more jobs – directly, through expanding employment in labor-intensive post-harvest handling, as well as indirectly, through inducing a shift to agro-industrial farming – and to creating better jobs. In addition, the evidence from several horticultural export sectors suggests that wages and employment conditions are determined to a large extent by institutional factors, in particular by the minimum wage and private standards. This corroborates the validity of the dual economy framework of section 2.

5. Development implications

Horticultural export growth has been associated with agro-industrialization and substantial labor market dynamics. In this section we describe the development implications of these dynamics, including direct and indirect effects. These development effects are well documented for the Senegal case-study and can be interpreted in the dual economy framework depicted in section 2.

5.1. Income mobility and wellbeing

The employment creation in horticultural export sectors has been documented to result in upward income mobility. For Senegal, it has been estimated that in the early stage of horticultural export expansion, employment in the export agro-industry increases household income with 50 to 60% (for different regions and using survey data collected in 2005, 2006, 2010 and 2013) (Maertens & Swinnen, 2009; Maertens et al., 2011). This income increase mainly comes from an increase in wage income, and is higher (in relative terms) at the lower end of the income distribution (Van den Broeck et al., 2017). This upward income mobility persists in more years. Estimates show that new entry into agro-industrial employment in the period 2013-2016 increases household income with 70%, again mainly because of an increase in wage income (Van Hoyweghen et al., 2018). The larger income effect in recent years is in line with the increase in real wages from 2013 onwards. Also workers remaining in agro-industrial employment are observed to experience substantial income growth in the period 2013-2016. This income growth either stems from an increase in wage income due to an expansion of the number of working days in the agro-industry – and especially the transition from casual or seasonal employment to year-round employment – or from an
increase in income from self-employment in farm and/or non-farm businesses. Put in the framework of the dual economy model, the evidence implies that during the early stage of agro-industry expansion when employment expands rapidly at constant wages, there are substantial income gains from the transfer of labor from the smallholder to the agro-industrial sector. The magnitude of these income gains may stem from a rather large difference between (institutionally determined) agro-industry wages and average labor productivity in the smallholder sector. The persistence of income gains in more recent years relate to both further (albeit slower) expansion of employment in the agro-industry and investment spillover effects (see next section).

![Figure 4: Evolution of poverty and inequality in the Senegal River Delta horticultural export region and in Senegal.](image)

The observed upward income mobility associated with horticultural export growth and employment dynamics, results in the reduction of poverty and extreme poverty in horticultural export regions. A comparison of the evolution of the incidence of poverty and extreme poverty in the Senegal River Delta region and in Senegal overall in the early stage of agro-industrial development (Fig 4.) shows that poverty reduction in the horticultural export region has been much more rapid than in the rest of the country. Also inequality reduced more rapidly in this region in this period. In terms of broader well-being effects, it has been documented that the shift from being a family laborer in the smallholder farm-household sector to being a formal employee in the export agro-industry, increases the happiness (or subjective wellbeing) of women for women in poorer households but not for women in relatively better-off households (Van den Broeck & Maertens, 2017). The documented poverty and well-being effects are again an indication that the existence of a dual economy structure and the rapid transfer of labor from the smallholder sector to the agro-industrial export sector contributes to rural development. The observed decrease in inequality implies that even in the early stage of rapid agro-industrial expansion and constant wages in the agro-industry – which corresponds to stage I in the dual economy model of section 2 – inequality among rural households can reduce.
5.2. Investment spillover effects

The development implications of employment creation in high-value agro-industrial export sectors go beyond direct income and wellbeing increases through increased income from wages, and include investment spillover effects. For Senegal, it has been estimated that employment in the agro-industry in results in increased expenditures on farm inputs and in investments in off-farm businesses (Maertens, 2009; Dedehouanou, 2012). It was estimated that a one percent increase in wage income from the agro-industry increases investments in non-farm businesses with 7 to 9 percent (Dedehouanou, 2012). This implies that wages earned in the agro-industry are partially invested in the smallholder farm and non-farm sector. In addition, from qualitative observations in recent years, we know that livestock-keepers in the Senegal River Delta region, increasingly rely on industrial feed, diminishing the need for labor-intensive herding.

The observed investment spillover effects from employment in the export agro-industry corroborate insights from the dual economy framework. The framework predicts that when surplus labor in the smallholder sector diminishes because of an outflow of labor to the agro-industry, productivity in the smallholder sector increases. In Senegal, productivity increases in smallholder farming and expansion of small-scale non-farm businesses occurred partially through investment and consumption linkages with the agro-industry. These direct linkages between the agro-industry and the smallholder sector might have been instrumental for the rapid growth of employment in the agro-industry and the transition to higher wages in the sector – or in other words, the interaction between the agro-industry and the smallholder sector reinforce the rural development process of creating more and better jobs.

5.3. Indirect gender effects

Finally, we observe particular gender related effects associated with the growth in horticultural exports and the expansion of agro-industrial employment among rural women in Senegal.

Figure 5: School enrolment and school expenditures for children with and without mothers employed in the horticultural export agro-industry in Senegal. Average share of children enrolled in school for boys
and girls in primary and secondary school (panel A) and average household and per child school expenditures (panel B). Source: Maertens & Verhofstadt (2013).

First, it has been documented that mother’s employment in the horticultural export industry increases primary and secondary school enrolment of children (Fig. 5). Estimated causal effects are large and indicate that mother’s employment increases the propensity to be enrolled in primary school with 27 percentage points for boys and with 22 percentage points for girls (Maertens & Verhofstadt, 2013). Second, it has been documented that female employment in the export agro-industry is associated with an increase in the age of marriage of women, an increase in the age of first child birth, and a reduction in the number of children or the fertility rate (Fig 6). Estimated effects indicate that agro-industrial employment reduces the number of children with 0.33 and that this effect is larger for illiterate women than for literate women and as large for poor as non-poor women (Van den Broeck & Maertens, 2015). These effects on child schooling and fertility are likely related to an increased empowerment of rural women who participate in the formal labor market.

Figure 6: Age of marriage and fertility among women with and without employment in the horticulture export agro-industry in Senegal. Average number of surviving children per woman for different age cohorts (panel A) and average age at marriage for different age cohorts (panel B). Source: Van den Broeck & Maertens (2015).

In the framework of the dual economy model, these effects imply that there are feedback loops between the smallholder and agro-industrial sectors in the long run. The rapid expansion of the horticultural export industry at constant wages has been possible partly because of attracting female (surplus) laborers to the agro-industry. This transfer of female labor is associated with women’s empowerment, improved child education and reduced fertility – which will result in less rapid population growth and a smaller but more educated labor force in the future. A more educated labor force might ease transition from unskilled labor in the smallholder and agro-industry sector to skilled labor in yet higher-value and higher-productivity sectors in the future development of the region.
6. Conclusion and future perspectives

A main conclusion from this review and from the three case-studies analyzed in this paper, is that the expansion of horticultural exports from developing countries and the associated process of agro-industrialization contributes importantly to labor market dynamics and rural development in producing regions. The discussion shows that labor market dynamics are crucial in understanding the development effects of high-value export growth and agro-industrialization. Through rapid expansion, high-value export sectors contribute to the creation of formal employment in rural areas, and drive a transfers of labor from a low productive smallholder sector to a higher productive modern agro-industrial sector. This transfer leads to economic growth in the rural economy. Proximity between the agro-industry and the smallholder sector causes direct investment and consumption linkages between the sectors, which accelerates the transition to higher wages in both sectors and reinforces a rural development process.

We may reasonably expect that, due to population growth, income growth and changes in dietary habits, demand for high-value produce will continue to raise in the international market. This implies that high-value export sectors may continue to expand. This expansion might take place in existing producing regions as well as in new regions. Based on the insights from this paper, we may expect a slowdown in the expansion of export production and agro-industrialization in existing producing regions. This paves the way for new regions to enter the market. New regions will likely be regions with a medium population density, where both land for export production and un- and under-utilized labor are available, but also open investment policies play a role in attracting FDI companies. Yet, governments may influence the slowdown in horticultural export expansion, e.g. through internal migration policies and labor market regulations. Also agro-industrial companies may anticipate upward pressure on wages and dwindling profits. Corporate strategies to sustain profits while wages are increasing may for example entail the production of new and higher-value products, or targeting more lucrative (and higher-demanding) markets. We may expect a slower transition towards higher wages and better employment conditions in the export agro-industry when the agro-industry is less well connected to a smallholder economy, as reinforcing investment and consumption linkages would be weakened. This implies there is policy scope for directing the location of agro-industrial export activity. Finally, we expect to see long-lasting development effects of the recent expansion of horticultural exports in developing countries. Wages and incomes are expected to increase further (or to start to increase) in horticultural producing areas and inequality is expected to drop.

Labor market dynamics play a crucial role in understanding and anticipating the development effects of high-value export growth and agro-industrialization. Despite the increased attention of researchers to labor market and employment issues in global value chains, research gaps remain. In particular, the of rural-to-rural migration and the linkages between an agro-industrial export sector and a smallholder farm (and non-farm) sector are poorly understood.
References


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