Global Food Security xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Global Food Security

journal homepage: www.elsevier.com/locate/gfs

Horticultural exports and food security in Senegal

Goedele Van den Broeck*, Kaat Van Hoyweghen, Miet Maertens

Division of Bio-economics, Department of Earth and Environmental Sciences, KU Leuven, Belgium

ARTICLE INFO

JEL codes:
F1
F6
I3

Keywords:
High-value food exports
Food security
Food access
Sub-Saharan Africa

ABSTRACT

Horticultural exports from developing countries are expanding. While concerns are rising about the consequences of this growth for local food security, there is no empirical evidence that directly measures this impact. We provide such evidence for Senegal, one of the African countries with a sharp growth in horticultural exports. Using secondary data and panel survey data, we analyse the link between horticultural exports and the availability, access, utilization and stability components of food security. Results suggest that horticultural exports contribute to the capacity to import food, and do not jeopardize availability of food at the macro-economic level. At the micro-economic level, we find that female wage employment in the horticultural export sector reduces the probability of self-reported food insecurity, improves the quality of food consumption, and shortens the hunger season.

1. Introduction

Horticultural exports from developing countries have increased tremendously during the last two decades. Average annual growth rates over the period 1995–2014 amount to 6.3% for developing America, 7.5% for Africa and 7.8% for developing Asia (Van den Broeck and Maertens, 2016). Horticulture has become the most important agri-food export sector for developing countries, having surpassed traditional tropical commodities, such as tea, cocoa and coffee. They are mostly destined for high-income countries, where consumer demand for year-round availability of fresh produce and for tropical fruits is increasing. These exports are often realized by medium- and large-scale farms who hire local labourers to work on their fields and in their processing units. A large number of workers are employed in horticultural export sectors; e.g. up to 500,000 in Kenya, 450,000 in Chile and 400,000 in Morocco (Fernandez-Stark et al., 2011).

Concerns have risen about the food security consequences of these exports in the countries of origin. Many countries that have become important suppliers of horticultural produce to the world market – such as South-Africa, Kenya and Peru – have high rates of poverty and food insecurity within their borders, and especially so in rural areas. Despite these concerns, Van den Broeck and Maertens (2016) conclude in a recent review article that there is no empirical evidence that directly measures the impact of horticultural exports on food security in developing countries. However, many studies have investigated the implications of horticultural exports, both at the macro- and micro-economic level, which allows to shed some light on the channels through which horticultural exports can affect food security.

At the macro-economic level, horticultural exports may affect a country's food security status both positively and negatively. On the one hand, horticultural produce is characterized by a high and relatively stable value which raises national foreign exchange earnings and a country's capacity to import food. On the other hand, dependency on food imports and fluctuating international food prices may increase a country's vulnerability (Khoury et al., 2014). Also, competition for resources (e.g. land, labour and water) between export production and food production for the domestic market may lead to general equilibrium effects that cause further food price increases (Patel-Campillo, 2010). Lately, concerns have been raised on the environmental sustainability of horticultural exports, specifically on the overexploitation of water and soil nutrients, and on pollution through overuse of chemical fertilizer and pesticides (Sierra et al., 2015; Schwarz and Mathijs, 2017). There is some evidence on stringent production standards inducing a reduction in pollution by horticultural exporters (Asfaw et al., 2009).

At the micro-economic level, wage employment in a horticultural export sector influences households' food security through different channels. First, households' direct access to food (i.e. through own food production) might decrease because land and labour are allocated to export production – as has been documented for example for the Colombian cut-flower industry (Patel-Campillo, 2010). However, if smallholders face liquidity constraints, wages earned in the export sector might alleviate these constraints and result in increased investments in own farm production, leading to higher farm output and

* Corresponding author.
E-mail address: Goedele.Vandenbroeck@kuleuven.be (G. Van den Broeck).

https://doi.org/10.1016/j.gfs.2017.12.002
Received 7 June 2017; Received in revised form 29 November 2017; Accepted 2 December 2017

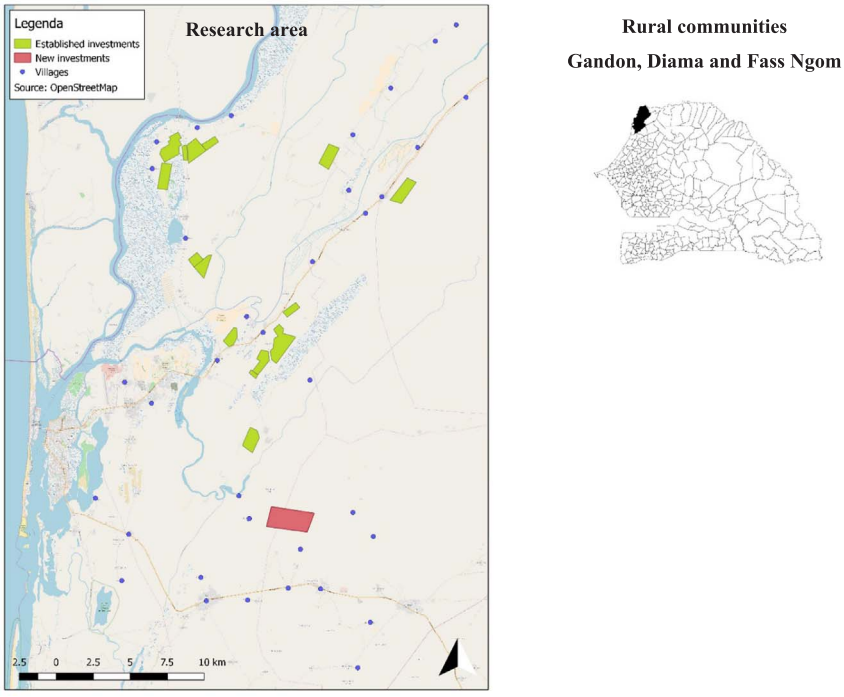

Fig. 1. Map of research area: Horticultural export sites and sampled villages in the rural communities of Gandon, Diama and Fass Ngom.

revenues. This has been the case for example in the Senegalese horticultural export sector (Maertens, 2009). Second, households' indirect access to food (i.e. through the market) might improve if employment leads to higher income levels. It has been demonstrated for Senegal that wage employment results in upward income mobility, particularly for the poorest households (Maertens et al., 2011; Van den Broeck et al., 2017). Yet, if food prices increase more rapidly than wages, households' purchasing power decreases, which might lead to food access problems – as has been shown for the horticultural export sectors in Mexico, Argentina and Colombia (Barron and Rello, 2000; Ortiz and Aparicio, 2007; Patel-Campillo, 2010). Third, the majority of workers in horticultural export sectors are women (sometimes up to 90%) (Barrientos et al., 2003). The creation of off-farm wage employment opportunities for women, especially in areas where such opportunities are limited, may lead to important gender and empowerment effects (Newman, 2002; Said-Alssopp and Tallontire, 2015; Van den Broeck and Maertens, 2015; Getahun and Villanger, 2017). It has been documented that if women earn their own income, it can increase their bargaining power in the household, which might further result in higher food and nutrition expenditures (Duflo and Udry, 2004; Doss, 2006; Fischer and Qaim, 2012).

The available evidence shows a mixture of effects but does not allow to draw firm conclusions on the link between horticultural export growth and food security because direct evidence is lacking. In this paper, we provide such evidence by investigating the effect of horticultural export growth on food security in Senegal. We focus on Senegal as one among quite a few African countries with net imports of staple food crops, with rapidly increasing horticultural exports – from 25.8 million USD in 2000 to 123.6 million USD in 2015 (UNCTADSTAT, 2017), and with a remaining food security problem – with a daily food supply of 2454 kcal per capita per day and 11.3% of the population undernourished in 2013 (FAOSTAT, 2017). We provide both macro- and micro-economic evidence on the link between horticultural exports and food security, and analyse the four different components of food security (availability, access, utilization and stability). We use secondary data for macro-level effects and primary data from a two-round panel household survey for micro-level effects. The detailed survey data allow us to analyse possible gender effects and to accurately estimate impacts of households' wage employment in the horticultural export sector on food security using fixed effects regressions.

2. Background and data

2.1. The Senegalese horticultural export sector

The horticultural export sector in Senegal has expanded rapidly during the past 15 years (Baglioni, 2015). The sharp boom in horticultural exports fits within the country's strategy of agricultural export diversification towards higher-value commodities, as the government has actively attracted (foreign) private investors in the sector. Nowadays fresh fruits and vegetables are the most important agricultural export commodity. Compared to other larger African countries, Senegal exports smaller volumes but at a faster average annual growth rate during the past ten years (15.8% compared to 10.2% for South-Africa and 5.4% for Kenya), illustrating the growing importance of the sector (UNCTADSTAT, 2017).

One of Senegal's principal horticultural export zones comprises the departments of Saint-Louis and Dagana in the north of Senegal. More specifically, the main export activities take place in three rural communities (Gandon, Diama and Fass Ngom). A first horticultural export company invested in this area in 2003. Since then the number of exporters has increased to six, and the cultivated area and produce variety are still expanding. The total cultivated area in 2016 was 2700 ha, occupying 4.1% of the total agricultural land in the departments (ANSD, 2015). All the export companies rely completely on a vertically integrated production system with primary production, post-harvest handling and exporting organised by the company. The investments have created approximately 6000 jobs by 2016, of which 80% is occupied by women. This represents a major source of employment in the three rural communities: 11% of the labour force works in the export sector while rural unemployment rates in the departments mount up to 45% (ANSD, 2015).

2.2. Data collection

We use secondary data to analyse effects at the macro-economic level and primary data from a two-round panel household survey to analyse micro-economic effects. We derive secondary data on national