



Certification and Access to Export Markets: Adoption and Return on Investment of Organic-Certified Pineapple Farming in Ghana

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Summary. — Global food markets demand adherence to food standards by farmers in developing countries, such as GlobalGAP and organic certifications. This paper analyzes the adoption and profitability of certified farming, using farm-level data of 386 Ghanaian small-scale pineapple farmers. We employ an endogenous switching regression model to examine the adoption and impact of organic certification on the return on investment (ROI) in pineapple farming. The empirical results indicate that both organic and GlobalGAP certification achieve a positive ROI. However, organic-certified farming yields a significantly higher ROI than GlobalGAP-certified farmers, mainly due to the price premium on the organic market.

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1. INTRODUCTION

A number of interesting trends have emerged in the global food markets over the last two decades. First, the restructuring of global food value chains and the increasing importance of private voluntary standards (PVS) driven by the trend toward stricter food safety and traceability standards in the major importing countries (Henson, Masakure, & Crandfield, 2011; Suzuki, Jarvis, & Sexton, 2011) have led to the marginalization of small-scale developing country producers and favored large-scale plantations (e.g., Jaffee, Henson, & Diaz Rios, 2011). Several PVS have responded by introducing group certification options for small farmers, to help enhance their integration into the global food market (Subervie & Vagneron, 2013). Second, during the same period of time, a horticulture industry has emerged in Sub-Saharan Africa (SSA), facilitated by diversification policies and the demand for tropical vegetables and fruit all year round by consumers in higher-income countries. Within the agricultural sector, horticulture may provide an opportunity for small-scale farmers, because of its labor intensity and high production value per unit.

Third, the demand for organic food has been increasing over this period. According to a report of the United Nations Conference on Trade and Development, worldwide organic food markets expanded by 10–15% in the last 10 years, whereas conventional markets only grew by 2–4% (UNCTAD, 2008). In Europe, the market has grown from 10.8 billion to 18.4 billion Euros during 2004–09 (FiBL, 2009). This is particularly significant because export crops are traditionally treated with pesticides to assure the required quality. Hence, the increasing significance of organic food exports will help mitigate the adverse impacts of high pesticide use and may also contribute to sustainable production by reducing land degradation, soil pollution, and soil erosion. To the extent that organic-certified food benefits from higher prices, relative to conventional food and also provides access to new fast growing high-end markets, it attracts new classes of investors (UNEP, 2007). Thus, organic certification could contribute to poverty reduction by helping to improve the incomes of smallholders engaged in this sector, as well as environmental sustainability through environmentally friendly production methods.

A well-known example in the fresh produce trade is the certification by GlobalGAP, which was created by a consortium of European retailers in 1997. Although it is based on a framework of Good Agricultural Practices (GAP) that aims at ensuring compliance with public food safety requirements, it also covers other issues including employment practices, worker safety, and traceability (Subervie & Vagneron, 2013). Retailers normally require that their suppliers are GlobalGAP certified, which virtually makes it a precondition for export of horticultural produce to many European and North American countries (Henson *et al.*, 2011). By contrast, organic certification meets the rising demand for organic products and also acts as a substitute for GlobalGAP certification. Requirements of organic certification concentrate on guaranteeing consumers that the products they buy fulfill organic production standards. In the EU, the regulations (EC) 834/2007 and (EC) 889/2008 control the production, processing, and trade of organic products. Organic-certified pineapples from Africa receive a positive price premium on the European market (Kleemann, 2011).

The impacts of certification with any private voluntary standard on small-scale farmers in developing countries are relatively well researched. Many studies focus on organic, Fairtrade certifications, with a large number of them dealing with coffee, and often Fairtrade and organic overlap.¹ Most researchers find modest positive impacts of different certifications on welfare, using different measures (see e.g., literature reviews by Blackman & Rivera, 2010; ITC, 2011; and papers by Asfaw, Mithöfer, & Waibel 2009; Bolwig, Gibbon, & Jones, 2009; Fort & Ruben, 2009; Maertens & Swinnen, 2009; Subervie & Vagneron, 2013; Valkila, 2009). Some other studies remain skeptical about the ability of organic and Fairtrade to help poor farmers because of access barriers, ambiguous effects on yields, or price premiums that may be too small to compensate for investment costs (Beuchelt & Zeller, 2011; Lynbæk, Muschler, & Sinclair, 2001; Valkila, 2009). Although the yield potential is estimated to be high on

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non-ideal tropical soils (Kassie, Zikhali, Pender, & Köhlin, 2008; and others), in fact yields are often lower on organic farms in these countries (Beuchelt & Zeller, 2011; Lynbæk *et al.*, 2001; Valkila, 2009), and the reduced dependence on potentially expensive external inputs is replaced by a reliance on the export market for price premia (Lynbæk *et al.*, 2001). There is another strand of literature that argues that certification is a high-entry barrier for many small-scale farmers and increases value chain coordination requirements, and as such tends to prevent many of them from participating in international value chains (Graffham & MacGregor, 2007; Graffham, Karehu, & MacGregor, 2007; Humphrey, 2008; McCulloch & Ota, 2002; Schuster & Maertens, 2013).

Nevertheless, once certification has been achieved effects are often regarded as positive. Several authors conclude that GlobalGAP certification has positive effects for producers. They gain access to high-value export markets and improve their farming knowledge leading to increased sales revenues (e.g., Graffham & MacGregor, 2007; Graffham *et al.*, 2007; Henson *et al.*, 2011).

Far less researched is the choice of the most appropriate certification once the decision to export, and hence to invest in any certification has been made. Pineapple farmers generally face a two-stage decision problem. In the first stage, they decide whether or not to access the export market, which is usually possible through a contract with an exporter. The second-stage decision involves choosing the certification standard for export.² Understanding the welfare implications of organic certification requires a clear understanding of both decisions. Most studies in the literature have considered the two stages of the decision problem as one, i.e., in the existing literature there is no distinction between export market access, contract farming, and certification in the treatment group. As pointed out by Bolwig *et al.* (2009), it is essential to distinguish between the effects of contract farming, export market participation, and certifications. This is because certification usually goes hand in hand with contract farming and export market participation. Most non-contracted farmers produce only for the local market, with quality and type of their products differing from those produced for exports (Asfaw *et al.*, 2009; Blackman & Rivera, 2010). Hence, they have not been able to identify the impact channel. This is the question we set out to tackle in this paper.

The study employs two different export-market oriented certification channels, which are organic certification and GlobalGAP certification. Our empirical analysis considers the effects of organic certification compared to GlobalGAP certification. From a development perspective, this analysis attempts to investigate the extent to which organic-certified farming offers new possibilities to farmers in contrast to export-oriented conventional-certified farming.

Most of the past studies examined the impact of certification on yields, prices received, farming practices, or welfare measures such as income, without accounting for the investment in the certification and its requirements (e.g., Bolwig *et al.*, 2009; Kassie *et al.*, 2008; Subervie & Vagneron, 2013). Henson *et al.* (2011) employed a propensity score-matching approach to estimate the impact of certification on the export revenue of firms that have achieved certification. In this study, we examine the impact of organic certification on the return on investment (ROI) in pineapple farming, accounting for production costs, including direct and indirect certification costs. The ROI is an indicator that takes into account the fact that farmers operating as entrepreneurs do not only concentrate on improving farm income, but also consider the profitability of their investment (Asfaw *et al.*, 2009;

Barham & Weber, 2012; Udry & Anagol, 2006). We utilize recently collected farm-level data of 386 Ghanaian pineapple farmers from the Central, Eastern, and Greater Accra regions of Ghana in the empirical analysis.

Our study also differs from previous studies in terms of the empirical strategy. We employ an endogenous switching regression approach to account for selectivity bias based on both observable and unobservable factors, and to capture the differential impact of organic certification on both adopters of organic certification and GlobalGAP certification. The approach thus allows us to examine the determinants of adoption of the organic certification, as well as the impact of the adoption decision on return on investment from organic certification and GlobalGAP certification. We also employ a propensity score-matching method, which accounts only for observables, to examine the robustness of the results.

The rest of the paper is structured as follows: Section two gives an overview of the development of the pineapple sector in Ghana. This is followed by a description of the data used in the analysis. Section three presents the conceptual and empirical framework. The empirical strategy employed to estimate the effect of organic certification is then explained in section four, while section five discusses the estimated results. Conclusions and implications are discussed in the final section.

2. THE PINEAPPLE SECTOR IN GHANA

Exports of horticultural products have experienced substantial growth over the past three decades, with fresh fruits and vegetables now contributing significantly to the growth of the agricultural sector in the country. Pineapples were the first non-traditional export crop that Ghana produced in the 1980s. Pineapple exports increased rapidly from the mid-1980s until 2004. A decline in exports set in after 2004, visible in Figure 1. The decline resulted from a shift in the pineapple variety demanded on global markets from Smooth Cayenne to the MD2 variety (FAO, 2009). The market share of Ghanaian pineapple on the European market fell from 10.5% in 2003 to 5.2% in 2006. Many farms stopped producing pineapple, or went bankrupt, while others switched to the MD2 variety. Subsequently, alternative pineapple industry strategies such as processing of Smooth Cayenne and Sugar Loaf evolved in importance. The latter variety is usually produced for the local market.³ It is estimated that about 40,000 tons of pineapple were exported from Ghana in 2011 (Figure 1).

Pineapple farming in Ghana is mainly located within a radius of 100 km north-west of the capital Accra in the regions of Greater Accra, and the Central and Eastern Region. The pineapple sector is dualistic in structure, with few large/medium-sized producers, and many small-scale farmers, who sell their fruits on the local market, or as out-growers to an exporter, processor, or large farm for export. The focus of the present study is on producers for the export sector. Pineapple export in Ghana is predominantly organized by export companies or processors, many of which also engage in own farm production. About 40% of all exported pineapples come from smallholders (UNCTAD, 2008; personal information given in interviews with the Ghana Export Promotion Council and the Sea Freight Pineapple Exporters of Ghana (SPEG)). The relationship between exporter and smallholder is usually oral, or based on written contract (Suzuki *et al.*, 2011). Some exporters provide farm inputs like pesticides and herbicides, extension services, or credit.

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