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Food safety standards and international supply chain organization: A case study of the Moroccan fruit and vegetable exports

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ABSTRACT

This paper addresses the issue of international food supply chain organization faced to food safety standards. The case of Moroccan fruit and vegetable supply chain is taken as an example. The dynamics of Moroccan food safety legislation and regulatory systems and the measures taken to facilitate export ex-ante compliance capacity with target market requirements are analysed. The results of a direct survey on producers/exporters in the Souss Massa Region are presented. Operators are classified according to the typology of vertical linkages in producers/exporters, pure exporters, and cooperatives. The relations among the typology of operators, targets markets, prevailing modes for food safety governance, and compliance costs and benefits with food safety standards are discussed.

1. Introduction

Agri-food supply chains extend beyond national boundaries, partially facilitated by a policy environment that encourages more liberal international trade. Rising concentration within the downstream sector has driven a shift towards "buyer-driven" global value chains (GVCs) extending internationally with global sourcing and the emergence of multinational key economic players that compete with increase emphasis on product quality and safety attributes. Raising concerns and awareness regarding the safety of food have lead to increasingly strict regulations. Food import safety constitutes an important axe of European food safety legislation and aims at ensuring that all the merchandises entering the EU market comply with the same regulations that are imposed to European producers. European regulations are considered as the most severe at international level, as compared, for example, to the Codex Alimentarius. *EU norms are thus the object of controversies and complaints by developing countries (DCs) arguing that their continuously strengthening illegitimately hinder their access to international market*. In addition, a plethora of private standards has emerged that operate alongside the regulatory system especially implemented by large food retailers, manufacturers and service operators, reflecting both their large market power and quality-based competitive strategies.

Increasing attention has been given to the impact of food safety standards on agri-food trade and notably on developing countries' export performance (see for example Aksoy and Beghin, 2005; Beghin & Bureau, 2001; Oyejide, Ogunkola, & Bankole, 2000). A major concern is that food safety (especially private) standards lead to the exclusion of the poorest farmers, who are unable to comply with stringent requirements due to a lack of technical and financial capacity.

Structural inefficiencies may exacerbate difficulties in complying with food safety measures. Additional compliance costs constitute a burden (especially for smallholder farmers) and may hinder their participation in high safety-discerning value chains and/or a reduction of export volumes due to increased variable costs. However, the evidence on the impact of food safety standards on farmers is mixed and several studies show "inclusion effects" and opportunities provided to small farmers by buyer-driven supply chains.

In this context, Morocco fruit and vegetable sector is often taken as an example of successful integration in European market. In the framework of the agricultural strategy "Green Morocco Plan",

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Morocco has moved towards the development of high-value export supply chains. Moroccan export infrastructure and procedures show a degree of collaboration and vertical integration, which has facilitated the international success in the EU market. Both producers and exporters are organized in cooperatives and exporting groups or associations: the association of fruit and vegetables producers and exporters (APEFEL, which groups nowadays five hundred producers/exporters and accounts for 70% of fruit and vegetable exports), the "Morocco Fruit Board" (marketing platform). In addition, other export related institutions are the Morocco export promotion centre and the Autonomous Establishment for export control and coordination, which carries out inspections, export related controls and certifications. Furthermore, suppliers and exporters, who operate in a highly coordinated supply chain, are likely to be supported by importers in the implementation of standards.

Given these premises, the objective of this paper is twofold. First, the paper aims at illustrating the dynamics of Moroccan food safety regulatory system and the measures facilitating ex-ante compliance capacity with food safety requirements on destination markets. Second, the objective is to characterize the structure and organization of fruit and vegetable export supply chains by identifying the typologies of vertical linkages along the chain, the state of compliance with international food safety standards, and the perceived compliance costs and benefits. Concluding remarks and suggestions are provided on the linkages between food supply chain organization and prevailing modes for food safety governance.

2. Background of the case-study

The present section briefly presents an overview on Moroccan fruit and vegetable export figures (Section 2.1). Then, it focuses on export market constraints by analysing the role of public and private food safety regulations and the role of supply chain organization resulting from the strategies of global players. More specifically, it introduces safety-specific market access constraints (public and private food safety regulations) focussing on the European market (Section 2.2.1). After that, based on the relevant economic literature, a typology of *global value chains* is identified according to the stringency of food safety requirements and the prevailing nature of relations between upstream and downstream operators (Section 2.2.2).

2.1. Overview on moroccan fruit and vegetable export figures

The fruit and vegetable supply chain (FVSC) is one of the most relevant segments of the Moroccan agricultural sector. In addition to its financial importance,[3] it plays an important socio-economic role, accounting for a high share in rural employment.

In 2013, the total value of Moroccan food exports was approximately 33.3 million dirham (DH), or 18% of the country's total exports. Tomato is the primary agricultural export, totalling 3611 MDH, or 10.8% in 2013. Citrus is the second agricultural export, earning 3235 MDH, or 9.7% on the total food exports.[4] Basing on a report published by the MAPM/DSS,[5] the global volume traded by Morocco amount to 1170 thousand tons. Morocco recorded an increase of 10% of vegetable exports that reach 843,000 tons (2013/2014). The various vegetable recorded also an increase of 14% during the same campaigns.

The Souss-Massa-Drâa region is the first area for early fruit and vegetable production and exports accounting for more than 70% of production and 75% of Moroccan exports in value (El Hadad-Gauthier & Tozanli, 2014; ORMEVA, 2007). The vegetable crops in the region of Souss Massa cover a total area of 16,000 ha with a total production of 1,500,000 tons. Early vegetables cover an area of 8080 ha, of which 68% tomatoes. During the last decade, early vegetable exports experienced a great progression evolving from 215,000 to 800,000 tons (in 2012/13), of which 53% are tomato exports.[6] Exports of the category "various fruits"[7] (Melon, Strawberries, etc.) reached 100,040 tons in the same year (2012/13) or 13% of total vegetable exports. The share of the Souss Massa region accounts for 36% of total "various fruits" exports. The Souss-Massa-Drâa region accounts for 60% of national tomato production and 80% of national greenhouse production.[8] According to Aubert, Bouhsina, Codron, and Rousset (2013) three types of actors may be considered in the tomato export chain: growers, packers, and exporters.

About 8000 growers supply vegetables for the export market. Vegetable growers are highly specialized and tomato is usually the main crop (50%–70% of the cultivated area). Out of the 500 growers supplying the tomato export chain, a vast majority is located in the Souss-Massa-Drâa region (Codron et al., 2014). 13,000 growers supply citrus, of which around 50% are located in the Souss-Massa-Drâa region. Growers can be divided into three categories: contractors (delivering the product to private packing houses), cooperators (members of a cooperative station), and integrated producers (owning both greenhouses and packing units). EACCE registers 158 packing plants processing vegetables and 51 processing citrus. Out of the total number of packing plants, 84 fruit and vegetable packing plants (either cooperatives or private entities) are located in the Souss-Massa-Drâa region. Packing plants negotiate export quotas with the government and provide technical assistance and information to growers related to certification and markets. Finally, 15 exporters are identified in Morocco that can be fully vertically integrated from production to import, integrated backwards into production, or not integrated, thereby acting as service providers.

Ninety percent of Moroccan fresh produce exports are oriented towards Europe, where food safety concerns have become much more marked over the last two decades and have resulted in increasingly strict public and private regulations (Codron et al., 2014).

2.2. The role of institutions and supply chain organization in food safety governance: a conceptual framework

2.2.1. Public and private food safety regulations

At international level, there exist two main standard-setting organizations: the Codex Alimentarius Commission (CAC) and the International Organization for Standardization (ISO). The CAC was

[3] The vegetable sector generates annual gross value of about 7 billion dirhams and provides nearly 15 million working days.

[4] Because of the labour intensity, these subsectors are particularly important in terms of income and employment generation, especially for the female labourers hired in the farms and packing houses.

[5] Ministère de l'Agriculture et de la Pêche Maritime, Direction de la Stratégie et des Statistiques, (Note stratégique N° 98, 2014).

[6] The recent rapid increase of tomato exports is primarily due to better productivity and to the development of new small-sized tomato segments (cherry, cocktail) (Codron et al., 2014).

[7] "Various fruits" category is composed essentially of Melon, with 51% (largely of the Souss and Tensift) followed by strawberries with 18% (predominantly North and Gharb Saiss).

[8] The Moroccan FVSC has a dual structure. Production for domestic and market exports is usually separated. This separation is evident for vegetables. While early vegetables destined to the export market are produced in technically highly advanced production systems in plastic greenhouses, those for the national market mainly stem from open field production. The production of greenhouse tomatoes is mainly located in a regional cluster in the south Atlantic coastal strip in the region of Souss Massa.