FACTORS CONSTRAINING PARTICIPATION OF SWAZILAND'S MUSHROOM PRODUCERS IN MAINSTREAM MARKETS

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Abstract

Mushrooms have been cultivated in Swaziland since 2001 as part of a long-term programme which seeks to improve rural livelihoods through commercial production of non-conventional high-value commodities. Despite the availability of niche markets and various forms of support received by producers, Swaziland is still a net importer of locally consumed mushrooms. This study uses a value chain approach to identify the underlying factors constraining local production and producers' participation in mainstream markets. Understanding the nature of these constraints is very important from a policy perspective as this process will inform the formulation of improved market access strategies required to achieve the programme's overall objective. The findings indicate that availability of marketable surplus is affected by production constraints emanating from lack of access to key inputs and services, which are more centralised and fully controlled by the government. While producers currently receive a minimum of about 64% share of the consumer price, their efforts to participate more profitably in mainstream markets are hampered by poor value chain governance and lack of vertical coordination, subjecting both producers and buyers to various forms of transaction costs. In attempting to address the identified constraints, this study makes several recommendations, which are reflective of producers' socio-economic status and Swaziland's institutional environment.

Key words: mushrooms, market participation, value chain, Swaziland

1. Introduction

Prior to 2001 mushrooms were not cultivated in Swaziland and their introduction was part of a United Nations Development Programme (UNDP)-funded initiative meant to assist Swaziland towards diversifying its agricultural base and improving rural livelihoods. The adopted strategy promotes the production of non-conventional high-value commodities (HVCs) that have not been explored by local farmers despite having a relatively high market demand in local and international markets. Currently, Swaziland's priority is placed on the oyster mushroom (*Pleurotus* spp) because it is the easiest and least expensive to grow (Chang and Miles, 2004). In contrast to other high-value food commodities (e.g., vegetables), mushrooms have relatively high levels of proteins, vitamins, dietary fibre and inorganic minerals (Guillamón *et al*., 2010). More importantly, they are effective in enhancing the human body's defence against various types of cancers, viral infections (including HIV), diabetes, constipation and cardiovascular diseases (Roupas *et al*., 2012). Typical of HVCs, which are known for having a relatively high income elasticity of demand (Jaffee, 1995), cultivated mushrooms are largely consumed by the urban working class and people with special diet preferences. These consumers usually purchase mushrooms from supermarket chain

Acknowledgments: The Council for the Development of Social Science Research in Africa (CODESRIA) is acknowledged for funding the research (grant SGRT.29T11). The usual disclaimer applies.

stores, whose procurement policies provide an opportunity for small-scale farmers to participate in mainstream markets, enabling them to generate substantial returns (Emongor and Kirsten, 2009). With over 63% of Swazis living below the US$2/day poverty line, of whom 75% reside in the rural areas (Government of Swaziland (GoS), 2011a), integration of rural-based small-scale producers into mainstream supply chains can enhance Swaziland's fight against poverty, food insecurity and rural-urban migration.

Despite the availability of niche markets for local producers, over 95% of mushrooms consumed in Swaziland are currently imported (Mamba, 2010). Since the mushroom development programme was incepted in 2001, no research has been done to study the underlying factors constraining local production and producers' access to markets, an objective that this study seeks to accomplish. While a considerable number of studies have been done in Southern Africa on this subject (see Ortmann and King, 2010, for a review), mushrooms have not featured in the debate and previous findings and recommendations cannot be generalised because of different commodity characteristics and institutional environments. Another point of departure is the use of a value chain approach (VCA), which enables the study to better identify unexploited opportunities and in response prioritise interventions that could improve operations at various stages of the entire chain. The following section outlines the data collection procedures. The results are presented in section 3, while section 4 concludes the article with policy recommendations.

2. Data collection

A "snowball" method (Goodman, 1961) was used to collect data from value chain actors. Initially, data were collected from a sample of 91 mushroom producers located in all the country's four agro-ecological regions who identified sources of inputs and mushroom buyers. Interviews with input suppliers and market intermediaries also identified other actors and institutions influencing the value chain. Given the very low number of identified input suppliers and market intermediaries, it was not necessary to generate samples beyond the production stage. Therefore, interviews were conducted with representatives from all organisations identified by producers and other interviewees. The organisations comprised of three suppliers of production inputs, three mushroom training and extension service providers , six suppliers of marketing inputs, 19 mushroom buyers (five hotels, three restaurants, 11 supermarket chain stores, and two fruit and vegetable traders), and three public institutions responsible for enforcing agricultural marketing and trade regulations in Swaziland. Data from producers were gathered between December 2011 and January 2012, whereas interviews with other value chain actors were conducted between June and July 2012. Additional information came from site visits where activities related to mushroom production and marketing were directly observed. The next section presents the study results in a format that follows the mushroom value chain, highlighting the main activities and constraints encountered in every stage.

3. Results

3.1. Production of oyster mushrooms

The first activity in mushroom production relates to spawn (seed) development, which is currently done by the government through the Mushroom Development Unit (MDU). Government's justification for having one supplier is that, as the industry is relatively new, consumers need to be protected from poisonous types of mushrooms, and producers from unscrupulous suppliers who

may provide them with a low quality product. The substrate bags, from which the mushrooms are grown, are donated by the government of Thailand and distributed by the MDU to producers for free. Substrate materials are readily available countrywide. However, the technology used to prepare the material, also donated by the government of Thailand, is available in four areas countrywide and not easily accessible to producers. After inoculation (planting), the bags are kept in an incubation room for about three to four weeks and will thereafter be ready to produce mushrooms. The incubation room is only available in one location and can only accommodate a limited number of bags at a time. After this period, the bags are withdrawn and transported by the MDU to producers' growing houses. Currently, producers are not charged for transportation of inoculated bags. While some producers have managed to construct their own incubation houses, the limited number of access points for spawn and substrate preparation technology makes it difficult to increase production capacities.

3.2. Marketing of oyster mushrooms

Currently, no cultivated mushrooms are exported from Swaziland and producers have not yet engaged in any form of mushroom processing. Instead, from what they harvest, about six to ten percent is consumed at household level and the remainder sold through four channels identified as:

- Channel I (Farm gate): Producers → Consumers;
- Channel II (Retail market): Producers → Supermarkets → Consumers;
- Channel III (Middlemen): Producers → Middlemen → Supermarkets → Consumers;
- Channel IV (Food services industry): Producers → Restaurants/hotels → Consumers.

About 528 kg of fresh oyster mushrooms were traded by the sampled producers between November 2011 and January 2012 through the identified channels. Further analysis indicated that 42% was sold through the farm gate and 52% through the retail market, whereas 2 and 4%, respectively, were sold through middlemen and the food services industry. Consumers at the farm gate are generally comprised of rural community members, whereas in the retail market and food services industry they include the urban working class, tourists and customers with special diet preferences. Restaurants and hotels sell processed mushrooms unlike retail outlets where raw mushrooms are marketed.

Middlemen consist of "entrepreneurial" mushroom producers who are able to negotiate better deals with some retail outlets. These producers buy already-packed mushrooms from their counterparts at the farm gate price for onward sale at a better price; hence, benefitting from the margin. Because of low locally-produced volumes, supermarket chain stores, the major mushroom traders, often source a relatively large proportion of their mushroom stock through their South African-based distribution centres. Together with restaurants and hotels, supermarkets also buy from local fruit and vegetable traders who import mushrooms from South African fresh produce markets. In the absence of stock from private traders, restaurants and hotels buy imported mushrooms from local supermarkets. Details on imports from traders could not be obtained due to the sensitivity of such proprietary information. However, information gathered from mushroom traders indicates that because its flavour and appearance, the button mushroom (A*garicus* spp), currently not produced in Swaziland, has a relatively high consumer demand compared to the oyster. Marketing margins and market intermediaries' share of consumer price are discussed in the next section.

3.3. Marketing margins and intermediaries' share of consumer price

Following Hardesty and Leff (2009), marketing costs and returns, as shown in Table 1, were estimated using value chain actors' description of the chronological sequence of activities performed from the period when mushrooms are harvested to the point when they are finally sold to consumers.

Computations were made on a per unit basis (kg of fresh mushrooms) for a producer who manages an enterprise of 400 substrate bags, the minimum enterprise size for sampled producers, assuming he/she supplies the same amount of mushrooms to the identified alternative marketing channels. Marketing costs comprise of costs of packaging materials, labour and transportation costs. Even though producers do not use hired labour, labour costs were estimated based on the average time taken to perform each marketing activity and Swaziland's official minimum wage rates.

Upon receiving the already-packed mushrooms, supermarkets screen them for quality using their own procedures which are based on visual inspection for browning, weight loss and microbial spoilage. The mushrooms are then displayed in refrigerators and generally sold out within a day. Restaurants and hotels add value by cooking the mushrooms as part of different recipes. However, given that mushrooms are rarely cooked alone, but in combination with various food products and ingredients, costing the value added by the food services industry proved to be an insurmountable challenge. Hence, the analysis for channel IV could not be included in this discussion.

Table 1. Market intermediaries' share of oyster mushroom consumer price in Swaziland, 2012

Marketing channels*	Market intermediaries	Particulars of marketing	E/kg**	Share of consumer price***
I	Producer	Marketing costs (MC)	5.67	100%
		Sale price (SP) to consumer	41.00	
II	Producer	Marketing costs (MC)	10.34	80.3%
		Sale price (SP) to retailer	51.80	
	Retail	Purchase price (PP)	51.80	19.7%
		Marketing costs (MC)	0.25	
		Sale price (SP) to consumer	64.53	
		Marketing margin (MM = SP - PP)	12.73	
III	Producer	Marketing costs (MC)	5.09	63.5%
		Sale price (SP) to consumer	41.00	
	Middlemen	Purchase price (PP)	41.00	16.7%
		Marketing costs (MC)	9.38	
		Sale price (SP) to retailer	51.80	
		Marketing margin (MM = SP - PP)	10.80	
	Retail	Purchase price (PP)	51.80	19.7%
		Marketing costs (MC)	0.51	
		Sale price (SP) to consumer	64.53	
		Marketing margin (MM = SP - PP)	12.73	

Notes:

* Channel IV is not included for reasons explained in the text.

** 'E' denotes Emalangeni, the Swaziland currency. E1 = US$ 0.1086 on 18th April 2013 (Central Bank of Swaziland, 2013).

*** Share of consumer price indicates the magnitude of returns earned by different market intermediaries in each channel. It is expressed as a percentage of the price paid by the final consumer. See Shepherd (2007) for details on the methodology.

Source: Survey data (2011/12)

Under the current programme, where farmers are supported with free substrate bags and transportation of inoculated bags, the cost of producing oyster mushrooms was estimated at E8.99/kg, with returns over variable costs of about E27.91/kg. Without the support, production costs would increase by approximately E3.57/kg. Table 1 shows that producers' share of the consumer price in all marketing channels are relatively larger than shares of other market intermediaries. In terms of net returns, producers earn E25.35/kg from selling at the farm gate, E25.92/kg from selling through middlemen and E20.67/kg from selling directly to the retail market. Even though the net returns are comparatively lower from selling directly to the retail market, mainly as a result of transportation costs, producers prefer this option as it offers a relatively more stable and dependable market. Besides the absence of written marketing contracts and having less bargaining power in setting exchange prices, producers do not have to rely on unpredictable buyer turnout as is the case with the farm gate option. Major institutional factors constraining mushroom production and value-addition are discussed in the following section.

Marketing institutional environment

When the mushroom programme was incepted, a formal market was established with the National Agricultural Marketing Board (NAMBoard), which collected mushrooms from producers using a refrigerated van. However, because of the limited production capacity and inconsistent supply, NAMBoard (a government parastatal) withdrew its support after two years, leaving producers to establish their own informal marketing arrangements. Ironically, mushrooms are listed under NAMBoard's scheduled products, implying that for every import of mushrooms, the parastatal receives a levy equivalent to 7.5% of the total value. Government's regulations dictate that NAMBoard should use the levy to develop local capacity to produce the same commodity (GoS, 2011b). However, in spite of Swaziland importing over 95% of locally consumed mushrooms valued at about E2.4 million annually (NAMBoard, 2012), no tangible investment has been made by NAMBoard in the mushroom industry thus far.

Despite the various forms of mushroom processing opportunities (see Rai and Arumuganathan, 2008), substantial investment in commercial processing and value-addition in Swaziland is partly constrained by the unfavourable regulatory framework. For instance, Swaziland's Canning Control Act (GoS, 1961) gives the power for controlling the development of food processing and marketing to the Minister of Agriculture through issuing of licences. This Act, which also gives the Minister the prerogative to issue an exclusive "canning" licence to "any person for such period as he may deem fit", hinders the participation of prospective investors. In view of the possible increase in market supply (as a result of diversification, improved production capacity and staggered production schedules), parallel plans are required to establish an integrated value chain governance system. Drawing from the identified constraints, the next section presents possible options that could be considered in fulfilling the above expectations.

Possible interventions for upgrading the mushroom value chain governance and coordination system

While Swaziland currently prioritises the oyster mushroom, this study highlights the importance of other types of mushrooms, especially the button. Diversification could create a demand for more inputs. Substrate availability should not be a major challenge given the abundance of agricultural and industrial waste in Swaziland. However, considering that training, spawn production and the technology used for substrate preparation are centralised and only offered by the government, it would benefit the

entire industry if such services are privatised allowing the government to assume a monitoring role. Despite that buyers did not identify quality as one of their major concerns, the absence of measurable quality standards subjects producers to having their mushrooms bought at lower prices or even rejected without justification. Furthermore, as the industry expands, parallel trade in wild mushrooms is likely to emerge. In the absence of mushroom food safety standards, this kind of trade could compromise the lives of consumers and the industry's reputation as desperation for income could lead to opportunists selling even the poisonous type of mushrooms to unsuspecting consumers.

With the current lack of coordination in mushroom marketing, major buyers are not spared from encountering transaction costs, given the small-scale exchanges they engage in with individual producers. However, changes that could allow the same volume of business to be concentrated in a smaller number of relatively larger and more secure transactions would benefit buyers and producers alike. This can be made possible by promoting collective marketing through farmer groups. In view of the sparse distribution of producers, marketing and transaction costs could also be reduced by establishing collection centres (fitted with cold storage facilities) in strategic areas and using refrigerated vans to convey mushrooms from these centres to mainstream markets. These assets would be important in preserving product quality and freshness.

Considering that current mushroom producers have limited agribusiness exposure, some form of assistance would be required to improve their competitiveness in the value chain. Engaging a facilitator who would, among other expectations, provide information and technical assistance could enhance producers' prospects to even venture into export markets. While a number of agencies, such as NGOs, could be considered, NAMBoard would be better suited for this role. Despite their subdued performance since establishment in 1985, some positive lessons could be drawn from NAMBOARD's recent experience in linking local vegetable producers with export markets and the attainment of Global Good Agricultural Practice (Global G.A.P) certification. Hence, an option that could be viable under the current environment would be to use the revenue generated from mushroom import levies to fund the establishment of collection centres and purchase of refrigerated vans, which would operate under joint management of NAMBoard and mushroom producing groups. NAMBoard, working jointly with farmer groups, would assume the responsibility to find remunerative markets. In order to sustain the groups' activities and cover recurrent expenses, a small fee per kg of mushrooms sold could be deducted from individual sales. Similar strategies were successfully implemented to assist Kenyan small-scale milk and banana producers (Staal *et al*., 1997; Fischer and Qaim, 2012).

4. Conclusions and policy recommendations

This study sought to identify the underlying factors constraining mushroom production and producers' access to markets in Swaziland. Using a value chain approach, the results indicate that producers' plans to expand production capacities and improve consistency in market supply are hampered by the difficulty in accessing key inputs such as spawn, substrate preparation technology and incubation services. Other constraints relate to the lack of diversification as farmers currently produce the oyster mushroom, yet major buyers are interested in the button, which has a relatively high consumer demand. Although producers currently realise a relatively larger share of the consumer price, more benefits could be realised if certain services currently offered by the government could be privatised. In view of the possible increase in market supply, it is important that an integrated value chain governance system is established in an attempt to enhance market access and facilitate the movement of mushrooms from producers to consumers.

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