

Local Vegetable Supply Chain: A case Study from Tsirang to Thimphu

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Executive Summary

A good supply chain means timely and cost-effective delivery of goods for the benefit of all actors in the chain. In Bhutan, prices of local vegetables are comparatively higher than imported ones and high prices of essential goods impacts consumers, particularly the urban population with lower income.

This study documents the supply chain of four commonly consumed vegetables (chili, cauliflower, cabbage, and beans) from Mendrelgang, Tsirang. Mendrelgang is one of the most important production areas for Thimphu's Centenary Farmers Market (CFM). The aim of this study is to identify areas of inefficiency and challenges within the supply chain and to make targeted recommendations for improvement.

In general, the supply chain is simple involving only a handful of intermediaries; and operations are low in scale and very rudimentary. There are certain things such as improving farm productivity, group marketing, reducing post-harvest losses and separating wholesale and retail marketing operations that could have positive impact.

Background

A supply chain is a network of entities that participate in the supply of goods or services to consumers. Proper management of this chain is vital for cost reduction, quality improvement, risk mitigation, and customer satisfaction.

In Thimphu, vegetables are mainly supplied from Dzongkhags such as Paro, Haa, Punakha, Wangdue, Dagana and Tsirang; and Mendrelgang in Tsirang is one of the major suppliers. The primary objective of the study is to determine the various supply chains from Mendrelgang to Thimphu, determine challenges and constraints within the links with the aim to provide recommendations to improve efficiency of the supply chain.

Methodology

Mendrelgang Gewog is composed of five *chiwogs*, viz. Reserbo, Pemashong, Tashipang, Dzomlingzor, and has a total of 384 households. A sample of 50 vegetable growers – 10 prominent ones from each *chiwog* were identified and information gathered using a set of questionnaires. Likewise, the 10 middlemen who serve Mendrelgang by way of produce aggregation, transportation and distribution of vegetables to Thimphu, the 6 major wholesalers based at the CFM Thimphu sourcing vegetables from Mendrelgang and the 18 prominent retailers at the CFM were interviewed using a different set of questionnaires.

Results and Discussion

A vast majority of growers in Mendrelgang are women (68 %) and more than half of the growers had not received any formal education and more than 84 % own less than 1 ac land (Tab. 1). While all vegetables are produced for the market, with such small land-holdings, it will be a challenge to achieve economy of scale since cost of operation will be substantial.

All middlemen have some form of education though none at university level and more than 60 % are men. Half the wholesalers had received no formal education while 17 % had obtained university level education. All retailers at the CFM were women and while most had been in this business less than 5 years, around 16% were in business for more than 15 years.

Table I. Demography of Mendrelgang growers

| Actors | Sample size | Gender | Education level | Land area under vegetable cultivation |
|------------|-------------|--------------------|---|---------------------------------------|
| Growers | 50 | M - 32% F - 68% | No Formal Education - 54% High School or lower - 42% Post secondary - 18% | < 1 ac – 98 % > 1 ac - 2% |
| Middlemen | 10 | M - 63% F - 37% | High School or lower - 100% | |
| Wholesaler | 6 | M - 33% F - 67% | No Formal Education - 50% High School or lower -33% Post secondary - 17% | |
| Retailers | 18 | F - 100% | No Formal Education - 50% High School or lower - 50% | |

Considering a substantial proportion of all actors in the chain had little or no education, despite their experiences, it behooves relevant agencies to provide appropriate modern knowledge and skills to improve their way of doing things such as by introducing women-friendly farming technologies, how to handle produce after harvest and how to use market information and plan their marketing operations.

There are no specific differences in the supply chain of different produce. For now, there exists four different chains (Fig. I); the difference being the number of intermediaries in the chain. Supply chain I and II are the more common, while III and IV appear less common.

It is evident that as the number of intermediaries increases, the final price does change correspondingly. Prices of vegetables increase by as much as 170 % from farm to consumers, which is high by any standards. In Supply Chain IV, wherein middlemen sell directly to consumers, prices increase only by 40%, but the produce in question are often the excesses remaining unsold to retailers at the CFM and frequently of inferior quality. Furthermore, the final sale in Supply Chain IV occurs on the outskirts of Thimphu Thromde since middlemen are not allowed to retail within Thimphu Thromde, where very few customers visit.

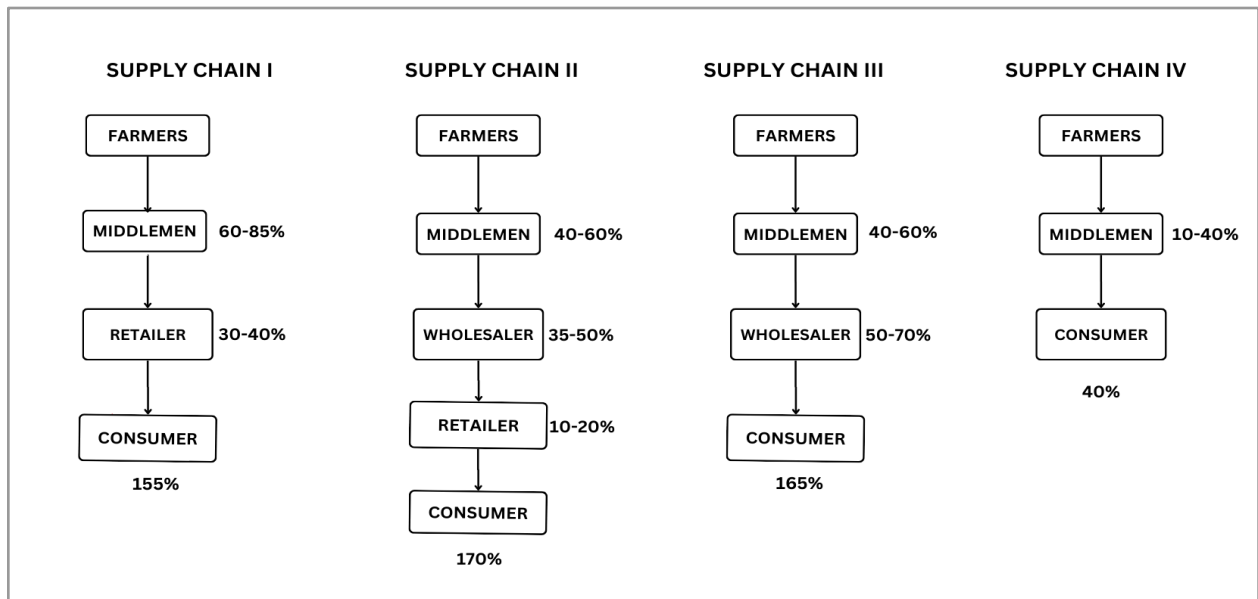
More than 82% of growers do not own vehicles to haul their produce. Those owning vehicles typically use them to take their produce only up to Tsirang town which enables them to sell at higher prices than prices offered by middlemen when they visit their farm. Middlemen are those who own vehicles and provide this very important link between producers and other buyers. They also perform the important task of aggregating vegetables from different farms to achieve a full vehicle consignment. The cost of transporting goods in Bhutan are one of the highest in the region and transporting in bulk always bring economic advantage.

Growers primarily negotiate farm-gate prices with middlemen using their experience and knowledge of past prices and any information on prevailing market prices that they can access. However, because of the perishability of the vegetables and lack of competition (among buyers at the farm level) they normally end up as price-takers.

At the CFM, middlemen haggle with wholesalers and retailers and their goal is to make a profit ranging from Nu. 15-50 per kilogram of vegetable, depending on the type of vegetable, the quality of produce and

the overall demand. The price they charge is inclusive of labour for loading, packaging (woven baskets, rice bags, crates) and transportation.

Figure I: Supply chain for vegetables Mendrelgang to Thimphu Thromde and markup at each stage



Wholesalers source produce from suppliers all over the country. Wholesale prices depend on quality of produce and market conditions. They typically include a markup to cover their input costs (packaging, rental and others) and keep profit margins of anything between Nu. 10 - 50 per kg of vegetable. Apart from retailers at the CFM, wholesalers supply to retailers from other wards within Thimphu town, hotels and institutions.

Retailers too price based on demand and supply after considering their input costs and their profit margin. Generally, they aim for a profit margin ranging from Nu. 10 - 40 per kilogram of vegetable.

Farm productivity is affected by pests and diseases, inadequate water to irrigate, high costs of inputs (seeds, chemicals and labour) and use of elementary farming technology (Fig. II). Of all the challenges, high pests and diseases incidences and inadequate water appears to be major factors. Therefore, when productivity is low, growers will attempt to offset their investment by charging high prices. Only greater per unit productivity and increased scale can not only drive down final costs but mean greater profits for growers. To do this, key challenges of water inadequacy, loss from pest and diseases and high input costs need urgent consideration.

Price volatility of vegetables and dependence on middlemen appears to be growers main challenge in getting good returns (Fig. III). While demand for essential food commodities such as vegetable prices remain fairly constant throughout the year, the volume of supply in the market changes frequently, which leads to price fluctuations. During the peak vegetable harvest season in many parts of Bhutan, supply exceeds demand and prices tend to drop, while at other times, prices remain high.

Because of perishability, lack of personal trucks, pressing work demand on the farm to market on their own and lack of unawareness of the market situation and other uncertainties keep growers more vulnerable to middlemen.

Fig. II: Major productivity challenges

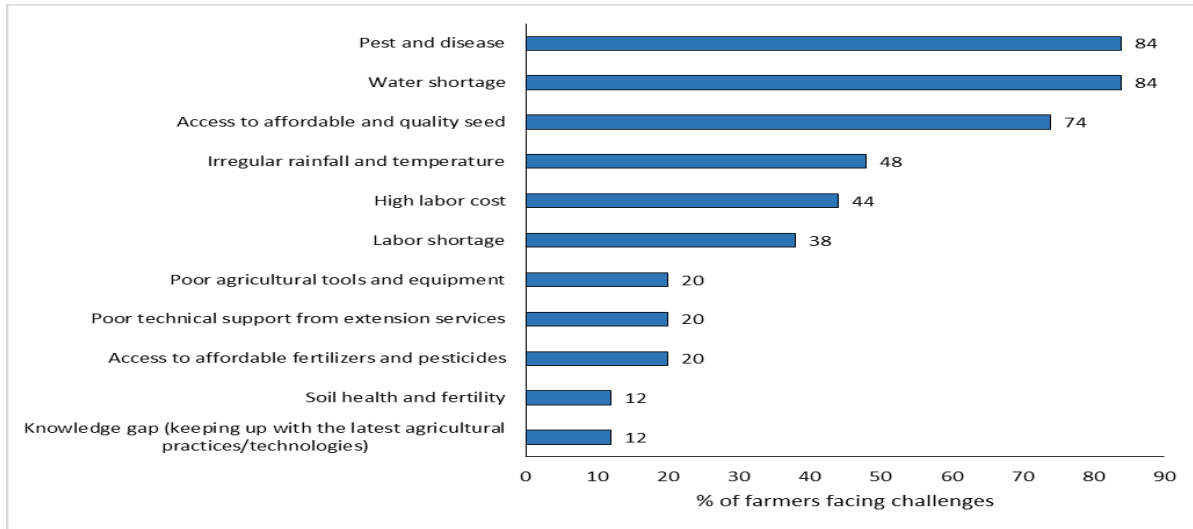
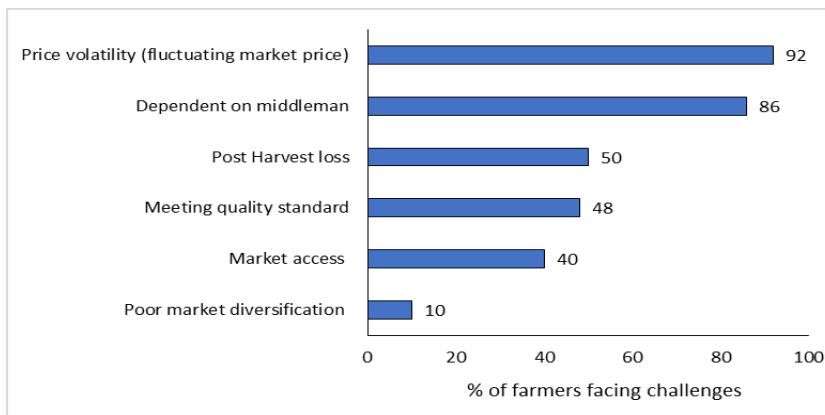


Figure III: Reasons for marketing challenges



Eliminating intermediaries to reduce the number of actors in the supply chain is a way to keep final prices low. The government's success in creating commercially oriented cooperatives will be key to enabling growers to achieve economies of scale and market their products independently. While there are challenges associated with working in a cooperative, this approach is best suited to achieving such an objective. Cooperatives could supply retailers at the main markets or supermarkets in Thimphu and other urban areas. If feasible, cooperative shops could also be established.

Middlemen face their own challenges and one of them is the restricted entry of their trucks into the CFM premise, thereby hindering their connections with wholesalers and retailers. Limited parking space and spaces for unloading, weighing and transfer of vegetables at the CFM impede efficient operations (Fig. IV). While the government has allocated space outside core town (in Babesa), the location is not ideal.

Inadequate space at the CFM in addition to lack of modern amenities such as cold stores at the CFM (Fig. V) is not conducive for business that demands adequate space for parking, loading/ unloading, weighing, storage, re-sorting and packaging.

Figure IV: Challenges faced by middleman

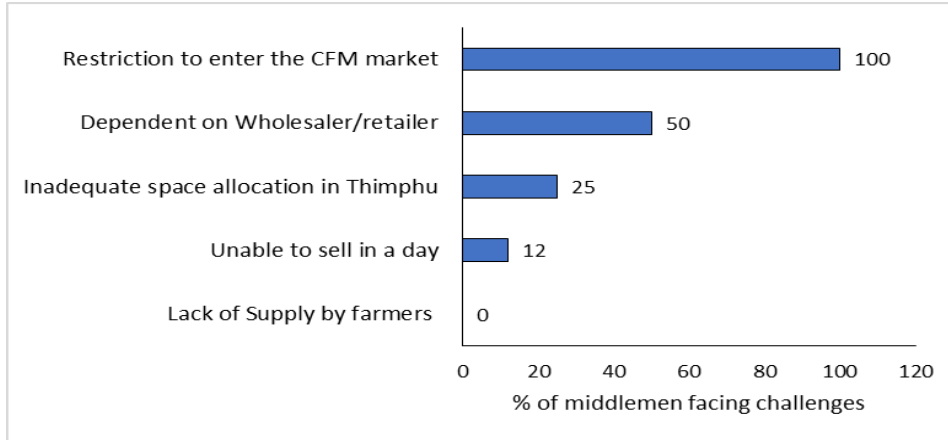
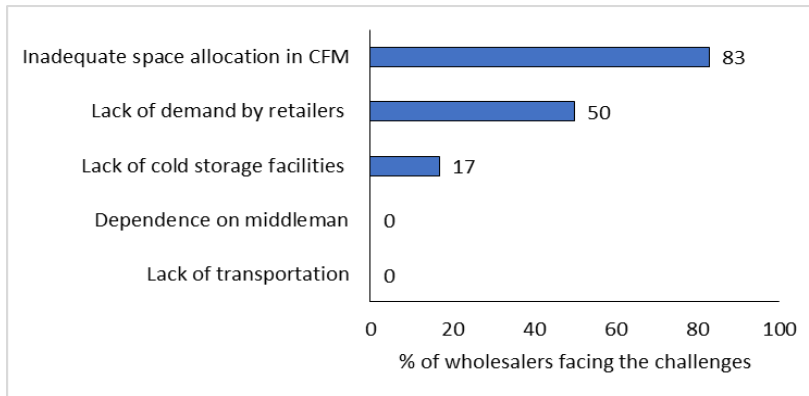
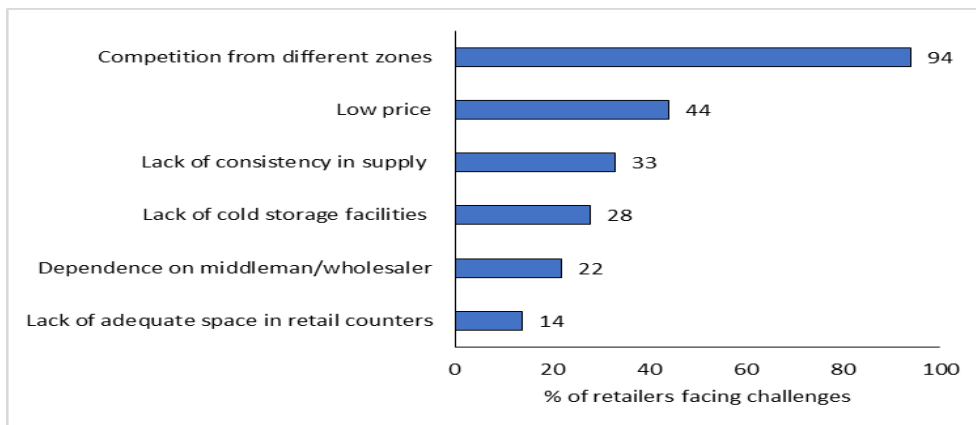


Figure V: Challenges faced by wholesalers



Retailers at the CFM view retailers in regions in Thimphu Thromde as affecting their business through competition; though this is a good thing for consumers in terms of convenience, choice and prices. However, lack of consistency of supply and lack of cold storage facilities and adequate space affects their business too (Fig. IV).

Figure VI: Challenges faced by retailers



The CFM not only is a central point where wholesalers congregate and do wholesale but is also a busy retail area. Multiple activities involving many people in a limited space for proper transactions are the main causes for operational inefficiencies. It would be ideal to identify and establish a separate wholesale centre at a spacious location with cold storage and other amenities, where wholesalers, middlemen and retailers can do business. The CFM could then be designated only for produce retail.

The high-cost markup at each stage in the supply chain to cover for postharvest quality deterioration warrants loss minimization interventions. Here, technical solutions to minimize both quality and quantity loss must be introduced along with advocacy on proper packaging and handling.

Conclusion

Supply chain efficiency is critical for all actors – right from producers to consumers. When we gain efficiency, producers and intermediaries are able to operate with reasonable profit while consumers get the benefit of better quality, lower price and greater choice. While substantial investments may be required in some government interventions such as creating new wholesale markets and building cold stores, the long-term economic benefit to the system will justify the investment. Other smaller interventions to reduce post-harvest losses, better market information systems, working in co-operation would also go a long way in improving the supply chain of vegetables in the country

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