

Regional Year-Round Supply of Vegetables in North Vietnam

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Keywords: vegetables, year-round supply, production, marketing

Abstract

A discussion is presented about the patterns in the present year-round supply of vegetables to large cities in the Red River Delta in North Vietnam. Especially during the hot summer season, vegetables are supplied from Dalat in South Vietnam or from Kunming Province in China. Generally speaking, importing vegetables from far away areas or foreign countries adds considerable cost to the product, while extensive transportation decreases product quality or limits the number of products that can be supplied. Aiming for more attractive consumer pricing, an increase in product quality and year-round product availability, options are explored for the regional year-round supply of vegetables from North Vietnam itself. The discussion is based on the agro-ecology of vegetable crops, on market opportunities during the year and on environmental considerations. It is argued that most of the vegetables presently available in the Red River Delta can be supplied from areas in North Vietnam itself. Special attention is given to environmental considerations to ensure sustainable production.

INTRODUCTION

In the urban areas of the Red River Delta (RRD) in North Vietnam, vegetable consumption per capita is quite high. Anh et al. (2004) reported a mean vegetable consumption of about 250 g per capita per day in Hanoi. With presently around 3 million inhabitants in Hanoi, this extrapolates to an annual consumption of approximately 275,000 tonnes of vegetables (excluding waste). A similar, high demand pattern is likely to exist in other urban regions in the RRD.

Presently, there is much seasonal variation in the origin of supply of vegetables to urban regions in the RRD. These origins include areas far away from the RRD. In this paper, a proposal is made for regional year-round production and supply from areas within North Vietnam itself.

Present Origin of Supply

About 53% of the annual vegetable demand in Hanoi is supplied by vegetable producers within a radius of less than 50 km from Hanoi (Anh et al., 2004). This percentage varies for different vegetables and seasons (An et al., 2003). An et al. (2003) monitored the main wholesale markets in Hanoi for a year and found that non bulky, highly perishable leafy vegetables are supplied from areas less than 30 km from Hanoi. Bulky and mildly perishable temperate vegetables are produced close to Hanoi during the winter season, but in the hot and humid summer season, more temperate sites far from Hanoi become the main suppliers. These areas include Dalat, Lam Dong province (1400 km) in South Vietnam and Kunming Province (550 km) in China. For example, for crucifers like head cabbage, 88-93% of the total demand was sourced from areas less than 30 km from Hanoi in the period from November to March, while these same areas had a zero percent share in supplying the total demand from June to August. Production of

temperate crops becomes difficult in the summer period in the lowlands around Hanoi due to high temperatures. Thus, in peri-urban areas of Hanoi and other provinces nearby such as Hatay, Hungyen and Haiduong, vegetables are often dominant in the cropping pattern in the winter season, but are largely replaced by rice or other food crops such as maize and soybean in the summer season.

Seasonality of Prices

The seasonal variation in the origin of supply contributes to the variation in consumer prices in the market in Hanoi. Temperate vegetables such as tomato, head cabbage or carrots show strong price seasonality. Their price is very high between June and September. According to the price analysis by An et al. (2003), the variation between the lowest and the highest seasonal price indexes can exceed 152% for carrots, 246% for tomato and 473% for head cabbage.

Local tropical vegetables such as wax gourd and morning glory are also quite seasonal in price variation, but their prices follow an opposite trend. Their prices are quite low during the hot and wet season when they are easily grown, and high in the winter period between December and February. The variation between the lowest and the highest seasonal price indexes reaches 94% for morning glory and 201% for wax gourd (An et al., 2003).

Seasonality in Consumption

Ali et al. (2006) showed that there is seasonality in vegetable consumption in urban Hanoi. During the rainy summer season, expenses for vegetables increase by 6% and the total quantity of vegetables consumed drops by 11% (compared to the average). The drop in consumption of tuber or root vegetables, cabbage and fruit vegetables, is in part compensated by an increase in the consumption of leafy vegetables. Although leafy vegetables are used in soups that are a dominant part of the diet of the Vietnamese people in the summer season, this seasonality of consumption is likely, in part, to be also related to the seasonality in origin of production and its associated seasonality in price variation.

REGIONAL YEAR-ROUND SUPPLY

Opportunities

1. Highlands. In principle, many of the vegetables that are now supplied during the summer season from far away places like Dalat and Kunming Province can be produced in the mountain areas of North Vietnam itself. The presence of many highland areas (Fig. 1) with a climate comparable to that of Dalat or Kunming, offers an opportunity to produce these vegetables in North Vietnam itself.

At present, no large scale commercial vegetable production takes place in any of the potentially suitable areas. It would appear that, apart from small scale local initiatives, no systematic effort aimed at the introduction of large scale commercial vegetable production and marketing has been made.

Table 2 shows the potential for a number of major vegetables to be supplied year-round from the RRD and the mountain areas by making use of cultivation in the lowlands and highlands during different seasons. For a number of the brassica crops, French bean, tomato, potato and carrots, cultivation in the local highlands during the summer season would secure regional supply.

Production in the RRD and highland areas will offer advantages such as lower transport costs. The shorter time between harvest and consumer purchase is likely to result in more fresh vegetables for the consumer. Furthermore, labour costs are lower in the highlands compared to the lowlands and intensive vegetable cultivation will provide employment for the local population. The high price for temperate vegetables between June and September (An et al., 2003), appears to offer scope for marketing regionally produced temperate vegetables in the RRD, assuming that regional production and marketing costs will be lower. Regional production of temperate vegetables is also likely

to contribute to a more even year-round consumption pattern. Production and marketing can be promoted by emphasising production in a clean environment, with safe cultivation methods, resulting in high quality vegetables at attractive prices for the urban population.

2. Lowlands. The cultivation of vegetables in the November-March season in the lowlands is often practised in rotation with rice during the summer season, resulting in less than optimum conditions for the growth of vegetable crops (Everaarts et al., 2006). This constraint is likely to be alleviated by permanent vegetable cultivation. With a growing urban demand for vegetables, permanent year-round vegetable cultivation systems in the lowlands can also contribute to a higher degree of regional year-round supply of vegetables in the RRD. Hung (2006) calculated that vegetable growers invested more labour on farming activities than what was needed. He also found that growing vegetables brought more income for farmers than cultivating rice. Thus, economically, it seems attractive for farmers to expand vegetable production. This argument is supported by Jansen et al. (1996) for peri-urban vegetable production around Ho Chi Minh City in South Vietnam.

Constraints

The cultivation of vegetables in the mountainous areas in North Vietnam is still limited. This means that there is little experience with both cultivation and marketing of the crops. Growers may require more cash money for the cultivation of vegetable crops compared to rice or corn and cash may be limited.

To promote the regional supply of vegetables to the RRD, suitable highland areas for production in terms of altitude, climate, soils, labour availability and transport must be selected. Criteria for selection have to be developed. As a next step, crops for local cultivation have to be identified and tested on site for yield and potential profitability, preferably working together with local growers or would-be growers. The formation of producer organisations for marketing products directly to traders in the metropolitan areas will be required and appropriate training must be delivered.

The selection of suitable crops for the November-March highland season requires further study. Temperatures during this season are rather low and the amount of available radiation may be limited because of cloudy conditions. For vegetables, the brassicas appear to be the most suitable, but they will have to compete with the lowland brassica crops during the same season. Perhaps a special brand name with emphasis on production in a clean environment with safe cultivation practises may help to make them competitive.

Environmental Concerns

Pesticide use in vegetable crops in the RRD is currently very high. According to Anh (2002), in the RRD, the average amount of pesticides used per hectare on vegetables is 5.52 kg; on rice 3.34 kg; on other food crops 0.88 kg; on short-growing industrial crops 3.34 kg and long-growing industrial crops, 3.08 kg. There are indications that pesticide use is higher in the summer vegetable crops, compared to the winter vegetable crops (Oanh et al., 2004). An (2003) found that the current use of pesticides on vegetables such as tomato, cabbage, chilli and radish is above the economic justification point.

It has been shown that waste-water irrigation and the excessive use of organic and chemical fertilisers may pose threats to the water and soil environment (Khai et al., 2007). Such problems may be overcome with the development of crop and site specific fertiliser application recommendations. Thus, an increase of year-round vegetable production and summer production in the highland areas, will, from an environmental point of view, be desirable only if it is accompanied by a change in farmers' perceptions of the risks they face from pests and diseases and inadequate nutrient supply. From a human health point of view, both for farmers and consumers, this requires serious attention.

CONCLUSION

There appear to be opportunities for the regional year-round supply of vegetables

to urban centres in the RRD. Apart from alleviating socio-economic constraints, creating marketing channels and so on, the cultivation of vegetables in areas with no experience with these crops, will have to start with field experiments to test the yield levels and cultivar-environment interactions to assess the agronomic potential and profitability. Compared to the present situation with long distance supply in summer, the regional production of vegetables is likely to be cheaper and may offer higher quality products. Special attention is needed with regards to the use of pesticides and fertiliser application.

ACKNOWLEDGEMENTS

We thank Dr. G.J.H. Grubben for his comments on the data in Table 2 and Ms. Ngyuen Thi Thu Ha (CARES-HAU) for supplying the map of North Vietnam.

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Tables

Table 1. Mean monthly temperature (°C) in some Northern mountain regions.

Region	Altitude (m)	Month											
		J	F	M	A	M	J	J	A	S	O	N	D
Hanoi	8	16	17	20	24	27	29	29	28	27	25	21	18
Moc Chau	1000 - 1200	12	13	17	20	23	23	23	22	21	19	16	13
Bac Ha	1400	11	12	16	20	23	24	24	23	21	19	16	12
Sapa	1600	9	10	14	17	18	20	20	20	18	16	12	10

Hanoi: Hanoi province; Moc Chau: Son La Province; Bac Ha and Sapa: Lao Cai Province

Table 2. Major vegetables and the potential for year-round production combining lowland and highland areas.

Family <i>Species</i>	Common name	Lowlands (0-500 m)		Highlands (1000-1500 m)	
		Apr.-Oct. 25-30°C	Nov.-Mar. 15-20°C	Apr.-Oct. 15-25°C	Nov.-Mar. 10-15°C
Brassicaceae					
<i>Brassica juncea</i>	Mustard	+++	+++	++++	++
<i>Brassica rapa</i>	Caisin,	++++	+++	+++	+
	Chinese cabbage	-	+++	+++	+
<i>Brassica oleracea</i> var. <i>botrytis</i>	Cauliflower	-	+++	+++	++
<i>Brassica oleracea</i> var. <i>capitata</i>	White cabbage	+	+++	+++	++
<i>Brassica oleracea</i> var. <i>gongylodes</i>	Kohlrabi	-	+++	++	++
<i>Brassica oleracea</i> var. <i>italica</i>	Broccoli	-	+++	+++	++
<i>Raphanus sativus</i>	Radish	-	+++	+++	++
Compositae					
<i>Lactuca sativa</i>	Lettuce	+	++++	++	++
Cucurbitaceae					
<i>Citrullus lanatus</i>	Water melon	++++	+	++	-
<i>Cucumis sativus</i>	Cucumber	++++	++	+++	-
<i>Benincasa hispida</i>	Wax gourd	++++	++	++	-
Liliaceae					
<i>Allium cepa</i>	Shallot	+++	++	++	-
Leguminosae					
<i>Phaseolus vulgaris</i>	French bean	-	++	+++	+
<i>Vigna unguiculata</i>	Yard long bean	+++	+	-	-
Solanaceae					
<i>Lycopersicon esculentum</i>	Tomato	++	++	++++	-
<i>Capsicum annuum</i>	Hot pepper	+++	++	+++	-
<i>Solanum melongena</i>	Eggplant	+++	++	+	-
<i>Solanum tuberosum</i>	Potato	-	+	+++	+
Umbelliferae					
<i>Daucus carota</i>	Carrot	-	+++	+++	+

Data based on data presented by Siemonsma and Kasem Piluek (1994), Grubben and Denton (2004) and personal estimates.

- = no cultivation advised, + + + + = very good cultivation possibilities

Figures

MAP OF THE NORTHERN MOUNTAIN REGION, VIETNAM

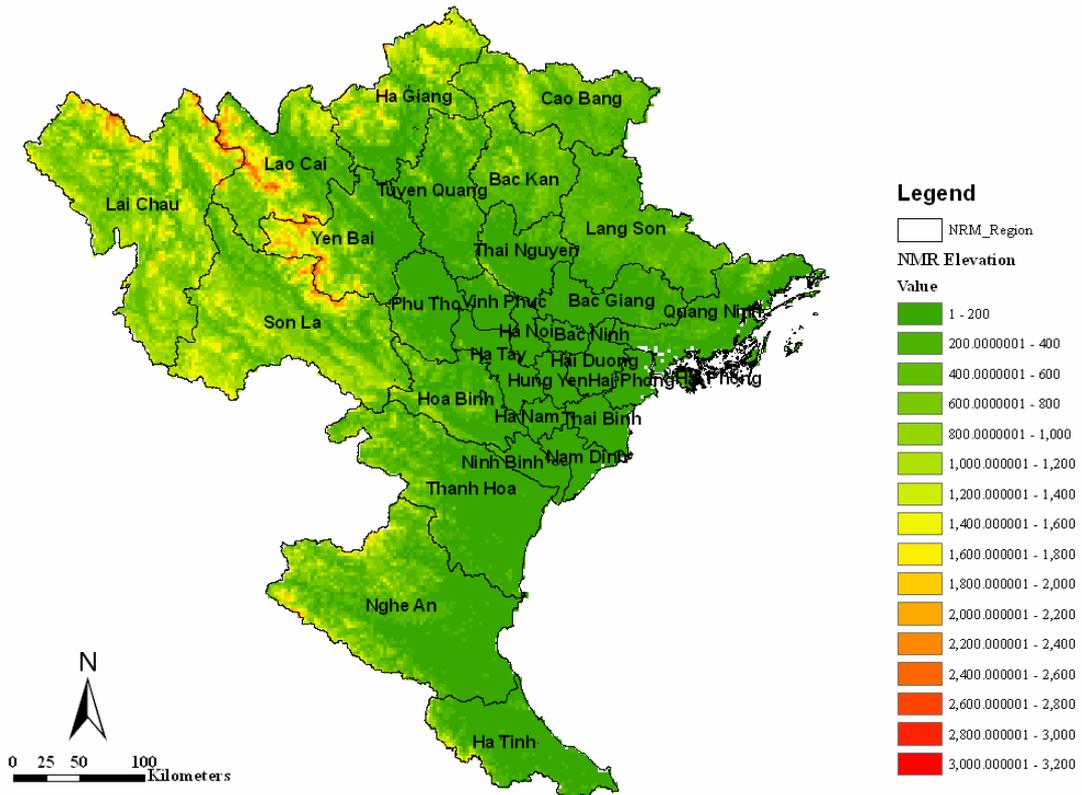


Fig. 1. Map of the Northern mountain regions of Vietnam.