ProPoor Horticulture

in Uganda and Vietnam

Quantitative assessment of the impact of the rise of the rose sector on poverty in North Vietnam

Authors

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Project Report PR-V04

The ProPoor Horticulture Project

This research project aims to present policy makers insight in how horticulture can be an important vehicle for pro-poor growth and development. The focus of governments and development assistance to agriculture in East Africa and in South East Asia should include fruit, vegetables and flowers. This focus should include development of the domestic market, away from the often dominant attention for export orientation only.

Governments and donor countries have the opportunity to support horticulture in the rural and peri-urban areas in developing countries, by means of trade policy and development policy instruments. Effective assistance measures should be embedded in the trends and trade-offs ranging from the local to the international level. The project aims to provide this insight and use it as a basis for recommendations on pro-poor development assistance.

Specific objectives are:

- To assess the conditions for fruit, flower and vegetable production, distribution and marketing to serve as a pro-poor activity.
- To assess current outlet opportunities for fruit, flower and vegetable products from the study, both on the domestic and international market, and to formulate expectations for the next decade.
- To predict the impact of the upcoming of supermarkets in the distribution of food, and the increased scope of quality and safety demands on the scale and organisation of horticulture supply in the study regions.
- To determine whether horticultural growth results in environmental degradation or high risk consumption due to pollution in the production environment.
- To suggest interventions for pro-poor growth of fruit, flower and vegetable production, distribution and marketing
- To suggest how EU trade policy and development assistance with regard to horticulture in developing countries can be made to work for the poor.

More information about the project and all realised outputs can be found on the website: www.growoutofpoverty.nl .

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Executive Summary

In this paper, we have assessed the current status of marketing chains in Northern Vietnam that supply roses to Hanoi and have quantitatively analyzed the effectiveness of these chains in sustaining livelihoods and their impact on the poor. We analyzed six representative marketing chains: three beginning with producers in Me Linh commune of Vinh Phuc province and three with producers in Sapa commune of Lao Cai province. All chains end with consumers in Hanoi city. The chains we studied involved multiple combinations of actors: farmers, wholesalers, flower shops, flower stalls, hawkers, and production companies and their workers.

The research team surveyed 65 rose producers in Me Linh commune, Vinh Phuc province (specifically Hoi, Lieu Tri, and Duong hamlets) and in Sapa commune, Lao Cai province, about their rose production in 2003 through semi-structured interviews. In Sapa, researchers additionally interviewed a large rose company about its rose production. In addition, two group interviews were held and 14 individual wholesalers at Quang Ba wholesale market were surveyed to gather information about their marketing in 2004. Sixty-six rose retailers were systematically sampled and interviewed about their purchasing, sales, income, and time allocation in 2004. Additionally, 16 workers at flower shops were interviewed in 2005.

Based on the information from group and individual interviews, we estimated the following numbers for actors involved in rose production and marketing chains that we investigated.

Table 0-1-1 Summary of number of actors

Actors	Estimated number of actors
Farmers in Me Linh	2150
Farmers in Sapa – small	18
Farmers in Sapa - large	10
Companies in Sapa	3
Workers at companies in Sapa (full-time)	15
Workers at companies in Sapa (seasonal)	100
Rose wholesalers at Quang Ba wholesale market	100
Farmer-sellers at Quang Ba wholesale market (daily)	287
Flower shops in Hanoi	238
Flower stalls in Hanoi	1064
Hawkers in Hanoi	1225
Supermarkets selling roses in Hanoi	0

We estimate that producers in Me Linh marketed over 173,500,000 roses in 2003, about 50% of which was ultimately sold to consumers in Hanoi. Large farmers in Sapa produced over 9,400,000 roses in 2003, 100% of which are sold to wholesalers in Hanoi. Small producers in Sapa sent all of their production of about 4,356,000 roses to Hanoi. In 2003, a large rose company said that all of their roses were sold to six wholesalers in Hanoi, and 60% of their approximately 2,300,000 total roses produced were sold to flower shops in Hanoi.

The largest wholesale market in Hanoi is Quang Ba wholesale market, which sells 73% of all wholesale roses. Ten percent of the 1000 wholesalers at Quang Ba are specialized wholesalers who buy and resell roses and other flowers. The remainder of the wholesalers are actually farmers who sell the roses they produce at the market. Market officials told us that there is an average of 520,000 – 650,000 roses sold daily at Quang Ba Wholesale Market by wholesalers, farmer/sellers, and assemblers. Seventy percent of the roses that come to Quang Ba will remain in Hanoi (Dang and Pham, 2005). From our quantitative surveys with wholesalers we estimated that about 52% of all roses that pass through Quang Ba are bought by hawkers and 47% by flower shops and flower stalls.

We estimate that Hanoi consumers buy 243,619,300 roses per year from flower shops, flower stalls and hawkers. If we include the 16,074,100 that are sold directly from farmers in Me Linh to consumers and the 1,545,700 roses sold from wholesalers to consumers, we get a total of at least 261,239,000 roses sold to consumers in Hanoi. Based on this estimate, our analysis of marketing chains covers 34% of the Hanoi rose market. The chain with the largest volume, 10%, originates with farmers in Me Linh, includes wholesalers and ends with hawkers. The next largest starts with farmers in Me Linh and goes directly to consumers (6%). The next largest chains are those in which Me Linh farmers sell roses to wholesalers who sell to flower shops and stalls (4% each of the Hanoi market). The largest market for roses from Sapa is those sold from farmers through wholesalers to hawkers (1.7% of the Hanoi market).

This paper applies a new methodology outlined in van Wijk, et al. (2004) that uses indicators to measure the employment and value (net and gross) generating capacities of marketing chains. From this methodology we can explore the current status of rose marketing chains supplying consumers in Hanoi. In this paper roses are measured in units of 10,000. Labour is measured in units of full time employment units (FTE), where one FTE is equal to 240 labour days, the approximate number of days that an office worker in Vietnam would work in one year. Calculations are based on information from actors who were exclusively associated with a particular chain and their associated prices and volumes of roses.

Of producers, those roses produced by small producers from Sapa require the most labour (212 days for each unit of 10,000 roses) followed by farmers in Me Linh who sell to consumers (123 days/10,000 roses). Large producers in Sapa and those from Me Linh who sell to wholesalers take 77 days to produce 10,000 roses. Roses sold by wholesalers require the least labour of all actors, only 3 to 4 days per 10,000 roses. This is rather intuitive as buying and reselling of roses requires much less labour than cultivating or peddling roses. Flower shops who source from wholesalers are the most labour intensive retailers, requiring 212 days/10,000 roses. In contrast, those roses flower shops buy from farmers require only 54 days/10,000 roses. Flower stalls spend 34-58 days to sell 10,000 roses, while hawkers spend 33 days.

HortiValFTE is an indicator created by dividing net revenue/10,000 roses by FTE/10,000 roses to find the value created per amount of labour required. Large producers in Sapa added the most value, 647 US$ per FTE, of the producers because they were very efficient with their labour, followed by a large rose company with 548 US$ per FTE. Farmers in Me Linh who sold to consumers only added 192 US$/FTE. Wholesalers who sourced from Sapa in the summer and Me Linh in the winter have the highest HortiValFTE (4176 US$/10,000 roses) number because of the high turnover of flowers and the little labour required to sell 10,000 roses. Hawkers earn 303 US$ net more per FTE when they buy from wholesalers rather than directly from farmers and flower shops earn 162 US$ more per FTE when doing so. Flower stalls who sourced from farmers made nearly 900 US$ more per FTE than those who sourced from wholesalers. This is because many flower stalls own rose farms as well (2 of the 3 stalls who source from farmers in our sample, source from their own farms). The chain with the highest HortiValFTE included the rose company in Sapa, wholesalers, and flower shops.

The rose marketing chain supplying roses to Hanoi consumers generated approximately 17,000 FTEs of employment, 27.8 million US$ in gross value, and 7.4 million US$ in net value in 2003-2004. Which type of chain to stimulate depends on multiplier effects, but the companies in Sapa who sell to wholesalers then flower shops, generate the most net value and provide labour in remote rural areas. The chain from farmers directly to retailers seems to appear the most Pro Poor.

In Me Linh, 13 of the interviewed farmers relied solely upon roses for income. For another 13 farmers, 70% of their income came from roses. In Me Linh, all poor and all rich households received at least 50% of their income from roses. In Sapa, all farmers relied upon roses for at least 50% of their income. Retailers, on the other hand, depended less on rose selling as a share of their income. Only six retailers relied on roses for 50% or more of their income, five of whom were mobile hawkers. Retailers often sell multiple types of flowers, on average depending on flowers for 52% of income and roses for 30% of income, and other family members often have jobs outside of flower retailing.

Producers reported a variety of alternatives they would pursue if they did not produce roses. Over half would do some other type of farming work. The most popular response was to switch from growing roses to vegetables. Almost one third of the respondents either could not report an alternative, would continue to grow roses or sell their land. A third of the hawkers interviewed would work on farms or with agriculture in some way. Over half of the flower shops would use their resources to open a shop or restaurant or begin selling food or goods. Eight percent of all retailers interviewed said they would be unemployed and 9% retailers said they did not know what they would do.

Currently, 15% of the farmers in Me Linh fall under the expenditure approach poverty line. If switching to rice or vegetable production, Me Linh producers are worse off than they are in their current situation. The best alternative for producers in Me Linh is off-farm income in trades or services. Currently, all rose producers in Sapa are above the three measures of poverty used here. If they left rose production to become skilled agricultural labourers, traders or unskilled labourers, some would be considered in poverty. In theory, rose producers in all locations have alternatives that could lift them from poverty if they were in poverty.

Large producers in Sapa have the highest average income of producers, while flower shops have the highest average income of retailers. Roses generate the greatest share of income for producers in Me Linh (79%) and the least for flower shops (23%). The average actor in the chains investigated received enough income per capita from roses alone to remain above the poverty lines (expenditure approach, 124 US$; 1PPP$/day, 72 US$; 2PPP$/day, 144US$). There are six farmers in Me Linh currently below the expenditure approach poverty line when all income is considered. Currently, none of the wholesalers or retailers is in poverty.

To determine which value chain is most “Pro Poor” it is important to know what wholesalers will do with their profit (multiplier effect). If farmers can not organise sales to flower retailers in a different way then they do now currently, farmers get a higher net value per FTE when they sell to wholesalers, compared with directly selling to retailers. At the current scale, value chain 1 seems to be most pro poor, as the hired labourers which are attracted by chain 6 are currently not the poorest. Actually the workers at the flower company are innovators who are there to learn. But when the cultivation area expands and more people will be employed, it is expected that also the poorer will join.

Therefore, developing rose value chains in cooler mountainous areas, targeting the hot summer period, has a lot of poverty reduction potential, as they generate employment in relatively remote rural areas. To make this option even more attractive, experiments should be done to see if with cheap plastic greenhouses the production period can be extend in the colder winter months. An interesting option could be to stimulate the company and out growers scheme model. Attracting foreign direct investment could speed up developments and give access to export markets.

The high use and especially misuse of pesticides for rose production is one of the most important disadvantages. This is especially a worry if this happens at large scale in the relatively unspoilt and fragile mountainous areas, where people still rely on surface water for drinking. It is crucial that applied research with farmers develops more sustainable cultivation alternatives.

Compared with growing other cash crops such as vegetables, rose cultivation requires more capital. Especially the first year is hard when investments have to be made in rose seedlings and a well, if irrigation water is not reliable. In Me Linh first year investments are about 4 million VND per sao (262 US$/sao). The poorer farmers can only take this step if they have access to credit. For Me Linh this certainly has been the case, as shown in the past 10 years (see Dang Viet Quang, 2004a). This might be different for ethnic minority farmers in Sapa. Hawkers require little capital to sell roses and they can recover their costs quite easily making 4-5 US$ for each day they work.

In Sapa another barrier to entry could be the need to have relations with traders in Hanoi, as currently no traders come to Sapa themselves. Orders are placed by wholesalers through telephone. Many of the current rose farmers have a background in rose cultivation in Me Linh and good links with traders. For H'mong farmers this might be a barrier as they do not yet have these links. But we expect that in the near future the current rose farmers and companies in Sapa will start out growers schemes. They will provide knowledge and buy the roses from farmers who do not have direct links with traders in Hanoi.

When a rose sector policy is designed, market saturation should always be kept into account. Vietnamese farmers have had bad experiences in the recent past, when their to eager adoption of a new cash crop led to a rapid reduction of prices (f.e. coffee). Unfortunately, no domestic rose consumption data are available, so no estimate can be made of the growth of the domestic market. According to the focus group discussions with farmers in Me Linh, profitability per sao has dropped from VND 8 million in 1993 to VND 5 million per sao in 2004 (Dang Viet Quang *et al.*, 2004a). Farmers expect profitability to further decrease to VND 3.5 million in 2010. The main reasons for this decline are the increased problems with pests and diseases (lower yields and more pesticides are needed), increase in input costs and a decline in prices for roses. This decline indicates that growth in supply has been catching up with the growth in demand.

According to estimates by key-informants the price for “Sapa roses” is expected to decline when the production area reaches 70 hectares. The total demand from the Northern market is expected too be satisfied when 250 hectares of roses are cultivated in Sapa (Dang Viet Quang *et al.*, 2004b).

This market saturation can be prevented by diversifying in types, colours of roses and possible other flower cultivation. In addition export markets should also be developed. The foreign owned DALAT HASFARM has shown that this is certainly possible to do from Vietnam. Till date Vietnamese roses from Northern Vietnam have hardly been exported, only sometimes to China. Cost price per rose is very competitive, but quality will have to improve a lot. More emphasis should be on extending the vase life of the rose. There is a lot of scope for quality improvement, as till now farmers have only had very limited access to research and extension. Through variety trials, integrated pest management and developing cheap plastic green houses a lot can be done to improve.

Besides making choices between different chains within a subsector, the methodology can also be used to compare different sectors. In which subsector would government or donor funding result in the highest employment generation and participation of the poor? Future research could explore more opportunities in selling roses from supermarkets, rose export markets, and Dalat's impact on the Hanoi rose market.

1 Introduction

1.1 Goal

In this paper, a marketing channel describes all activities that move a product from the producer to the consumer. A marketing channel is an overview of many individual marketing chains that link actors together and through which products flow from producer to consumer. In this study, we will identify the current status of the marketing channel in Northern Vietnam which supplies roses to Hanoi and quantitatively analyze the effectiveness of its chains in sustaining livelihoods and their impact on the poor.

1.2 Research Questions

How important are different activities within the rose market chain to sustain the livelihoods of the actors in that chain?
How much value and employment are generated by different types of chains?
How many persons depend upon rose marketing chains for their livelihood?
How many people stay out of poverty by participating in a rose marketing chain?

1.3 Scope

The marketing channel supplying roses to Hanoi is pictured in Figure 1-1. This paper discusses and analyzes six of the marketing chains pictured within the channel, three beginning with producers in Me Linh and three with producers in Sapa. All channels end with consumers in Hanoi city. Although we will not analyze all locations supplying Hanoi, we believe that our choice of marketing chains in this analysis is representative of all types of chains in North Vietnam which supply Hanoi.

1.4 Data

Producers

Pro Poor researchers surveyed rose producers in Me Linh commune, Vinh Phuc province (specifically Hoi, Lieu Tri, and Duong hamlets) in August of 2004 and in Sapa commune, Lao Cai province in October 2004 through semi-structured interviews. Questions were asked about their production in the previous year (August 2003 – July 2004 for farmers in Me Linh and

At each of the surveyed sites, researchers also interviewed key informants and held group interviews with both people involved in rose production and people who were not (Dang Viet Quang, et al., 2004 and van Wijk, et al., 2004). The key informants ranked all farms producing roses in 2004 by wealth (poor, moderate, and rich). From the each of the wealth ranking groups, farms were randomly chosen to be interviewed (i.e. stratified random sample).

Farms were interviewed about their rose production in 2003. Some of the farms were new entrants that had only begun producing in 2004; therefore the samples with no rose production or less than a full year of production in 2003 were excluded from the analysis. Table 1-1 shows the number of farms interviewed and included in this analysis.

Table 1-1 Rose producers interviewed, 2004

Commune	*Research site*	*Number of Interviewed Farmers*	*Number of Interviewed Farmers that produced roses in 2003*
Me Linh	Duong	33	29
Me Linh	Hoi	12	11
Me Linh	Lieu Tri	11	5
Sapa	Sapa	9	6

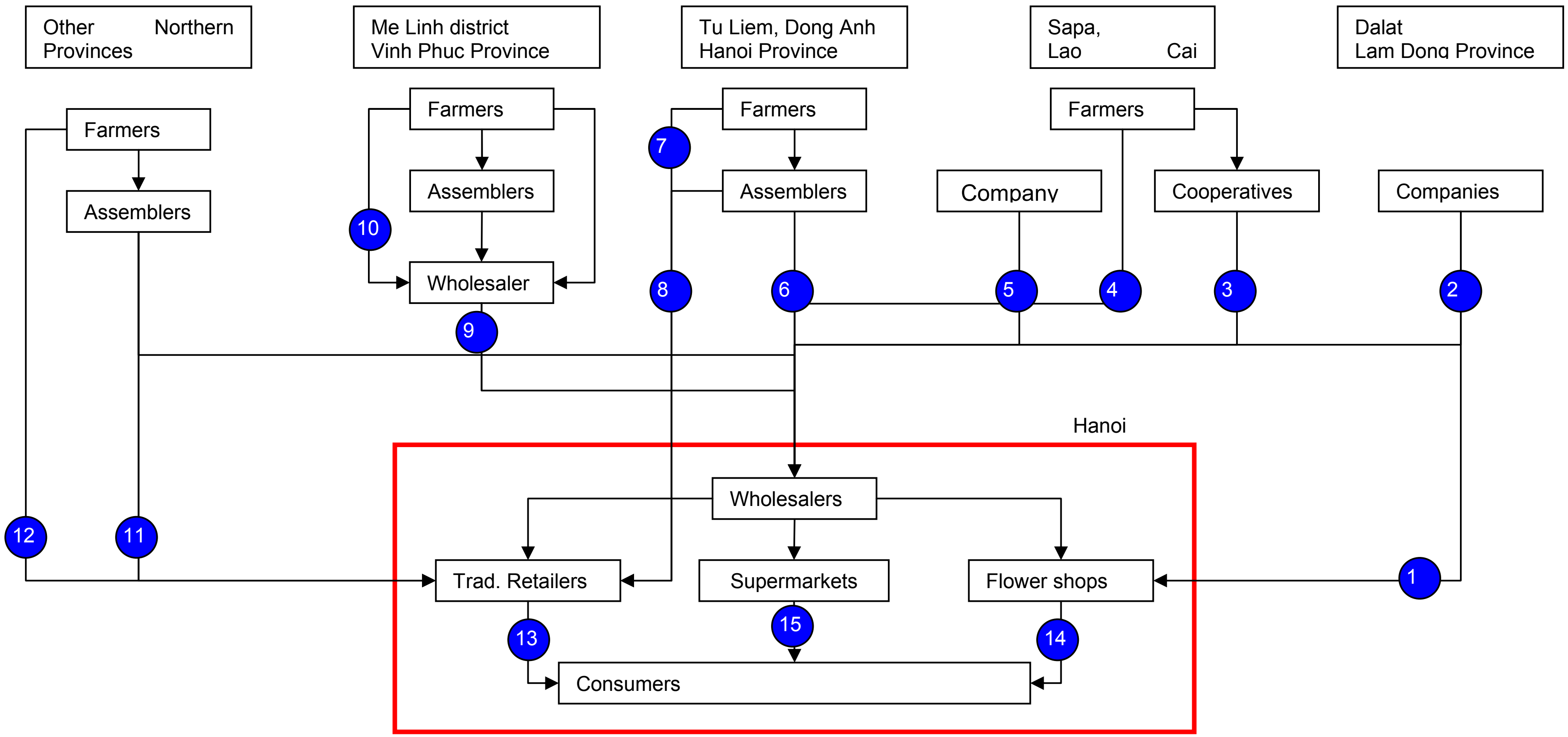


Figure 1-1 Rose marketing channel supplying consumers in Hanoi

In Sapa, researchers interviewed the a large rose company about its rose production. Quantitative information about this marketing chain is taken from that interview which can be found in van Wijk et al (2004).

Estimates from key informants are used as guidelines to check and balance the estimations made in this paper.

Wholesalers and Traders
In June 2005, ProPoor researchers interviewed 14 wholesalers at Quang Ba wholesale market to gather information about their marketing in 2004. In May, they had also interviewed one assembler in Quang Ba wholesale market. Additional information about this group of actors comes from some group interviews of wholesalers ("The Wholesale Market Survey", 2004 and Dang and Pham 2005). The remainder comes from information gleaned from the semi-structured interviews of producers and retailers (i.e. chain flows) and from key informants in Me Linh and Sapa (i.e. percent of production destined for Hanoi).

Retailers
Flower shops, flower stalls and hawkers were sampled systematically. Streets and markets were randomly chosen and then every fourth retailer was approached for an interview in March 2005. Information was gathered for the year 2004. Table 1-2 shows the number of each type of retailer interviewed. Additionally, 16 workers at flower shops were interviewed in 2005.

Table 1-2 Rose retailers interviewed, 2005

Retailer	*Description*	*Number Interviewed*
Flower shops	Flower shops with storefronts on the street	15
Flower stall	Fixed hawkers in official markets	14
Hawkers	Mobile hawkers in official markets	16
	Mobile hawkers in unofficial markets	5
	Mobile hawkers going door-to-door	16

In this paper roses are measured in units of 10,000. Labour is measured in full time employment units (FTE). One FTE is equal to 240 labour days, the approximate number of days that an office worker in Vietnam would work in one year.

The next section of this paper will define the rose marketing chains we analyze. Section three will identify estimates of the number of actors and the flow of roses through the chains. The fourth section will create indicators for comparisons across chains while the fifth section will look at the livelihoods of the players involved in rose marketing. The final section will offer some conclusions and recommendations.

2 The Rose Marketing Channel Supplying Hanoi, Vietnam

2.1 Chains

This analysis is primarily concerned with the roses sold to consumers in Hanoi and the chains through which they flow. The marketing chains in Table 2-1 will be analyzed quantitatively. These marketing chains were selected from the larger marketing channel diagram in Figure 1-1 as they are representative the *types* of chains supplying Hanoi.

Table 2-1 Rose marketing chains investigated

Location of Farmers	Chain	Description				
Me Linh, Vinh Phuc	1A	Farmers	Wholesalers		Flower shops	Consumers
	1B				Flower stalls	
	1C				Mobile hawkers	
	1D				Supermarkets	
	2A	Farmers			Flower shops	Consumers
	2B				Flower stalls	
	2C				Mobile hawkers	
	3	Farmers				Consumers
Sapa, Lao Cai	4A	Farmers - large	Wholesalers		Flower shops	Consumers
	4B				Flower stalls	
	4C				Mobile hawkers	
	4D				Supermarkets	
	5A	Farmers - small	Wholesalers		Flower shops	Consumers
	5B				Flower stalls	
	5C				Mobile hawkers	
	5D				Supermarkets	
	6	Workers	Large flower company	Wholesalers	Flower shops	Consumers

2.2 Actors

Some actors in the six marketing chains have similar roles and differing functions as discussed in Table 2-2. The following sections describe the surveyed actors in more detail.

Table 2-2 Actors in investigated rose marketing chains

Actor	Role	Function
Farmer Me Linh	Producer	These are households which produce roses with family labour and some hired labour on small plots (700 – 6000 m^2). Some households specialize in rose production. Others diversify income with vegetable or rice production and/or off-farm income.
Farmer –large and small Sapa	Producer	Some of these farmers are native to Sapa, typically Kinh ethnicity. Others are created and managed by distant families originally from Me Linh. Small farms produce roses on >1 ha typically with family labour. Large farms produce roses with family and hired labour on 2 – 4 ha.
Labourers hired by farmers	Producer	These labourers are hired to work with the roses or to cultivate other crops while the farmer cultivates roses.
Company	Producer	Companies are large scale rose producers (>10 ha) who operate entirely with hired labourers (75-100 seasonal labourers). Rose production may be one of many enterprises the company pursues.
Labourers hired by companies	Producer	These labourers are 90% women; 70% originally from Lao Cai; 14% ethnic minorities. They work under supervision of an experienced rose producer.
Wholesaler	Intermediary	Wholesalers make arrangements with farmers, cooperatives, companies or assemblers to receive roses for reselling to retailers. They can have permanent places in the wholesale markets or shifting places outside wholesale markets. This actor specializes in wholesaling and does not plant roses.
Labourers hired by wholesalers	Intermediary	
Flower shop	Retailer	These are retailers who specialize in selling flowers. They usually pay rent for their shop and work with 2-5 labourers. They usually have a storefront on the street.
Labourers hired by flower shops	Retailer	Labourers work in rose shops for wages, room, board, and occasionally bonuses.
Flower stall	Retailer	These are fixed hawkers in official markets. They usually pay rent for their stall inside the markets. They typically have 1-4 labourers.
Mobile Hawker	Retailer	Mobile retailers sell roses from motorcycles, bicycles, or baskets. This category includes mobile hawkers in official and unofficial markets and those who travel door-to-door.
Supermarket	Retailer	Large-scale generalist retailer

2.2.1 Producers

Farmers

Rose producing farm families have similar sizes across chains ranging from 3.7 (Chain 4) to 6 persons (Chain 5). Small farmers in Sapa use the most full-time family labour (3 persons). Both farmers in Me Linh and small farmers in Sapa have more full-time female family labour than large farmers in Sapa, whose wives probably still live in Me Linh. Part-time family labourers tend to be younger than the full-time family labourers. These are probably teenagers who attend school and also work with the roses. The three farms interviewed in Chain 4 do not have part-time family labourers.

Farmers in Chain 4 hire the most seasonal labourers (average of 406 days) and the most year-round hired labourers (7.3 persons/year). Farmers in Me Linh, on the other hand, use very little hired labour, averaging only 13 days per year and practically no year-round labourers. Daily labour rates for seasonal labourers are similar in each location, between 20,000-25,000VND. The monthly wage for workers hired by farmers ranges from 500,000-710,000 VND.

Farmers in Me Linh have the smallest rose area (2,211 m2) followed by Chain 5 (4560 m2), and large farms in Sapa have significantly larger average areas (Chain 4 – 25,833 m2). Thirty-one farms in Me Linh rent in land with an average size of 1174 m2. All of the land of farmers in Chain 4 is also rented in. One of the farmers in Chain 5 rent in land as do two-thirds of the farmers in Chains 1, 2, and 3. The average distance of the farm to the main road is 500m or less.

Some households interviewed either did not produce roses or were new entrants and had only a partial year of production. Two farmers in Sapa had begun producing roses but at the time of the survey had been producing for less than six months, and one did not produce roses. Non-producers in Me Linh were, on average, smaller by about one person which could also make the average age older than rose-producing households (see Table 2-3). Producers and non- and new producers in Sapa have similar family sizes and average ages. In Me Linh, non-producers work on nearly 1000 m2 more than rose producers in Me Linh while new and non-producers in Sapa work on half as much as producers in the same area.

Table 2-3 Producer descriptive statistics

	Me Linh producers Chains 1, 2, & 3 n=47		*Sapa producers – large Chain 4 n=3*		*Sapa producers - small Chain 5 n=3*		*Me Linh non-producers n=9**		*Sapa non- and new producers n=3*	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Males	2.53	1.23	2.0	0.0	2.7	1.2	1.78	1.30	2.33	1.15
Females	2.5	0.85	1.7	0.6	3.3	0.6	1.89	1.05	2.67	0.58
Household size	4.98	1.44	3.7	0.6	6.0	1.0	3.67	1.87	5.00	1.73
Full-time family labourers involved in rose production	2.72	1.37	2.3	1.5	3.3	2.3				
Males	1.24	0.79	1.3	0.6	1.3	0.6				
Females	1.48	0.75	1.0	1.0	2.0	1.7				
Average age	34.73	6.98	30.0	1.5	38.2	4.8				
Part-time family labourers involved in rose production	1.86	1.12	0.0	0.0	2.7	1.5				
Males	1.03	0.72			2.0	1.0				
Females	0.79	0.87			0.7	0.6				
Average age	24.72	18.29			18.2	6.8				
Seasonal hired labourers (days per year)	13.47	27.90	406.7	687.1	93.3	161.7				
Wage per day (1000 VND)	21.47	29.39	25.0	0.0	25.0					
Year-round hired labourers per year	0.02	0.15	7.3	7.5	1.3	1.2				
Wage per month (1000 VND)	500		635	191	710	410				
Roses (m2)	1,942	924	25,833	10,104	4,560	2,314			3506	4090
Cropped land (m2)	2,211	1,149	29,167	8,780	5,880	4,587	1,311	3,933	240	415
Garden (m2)	175	316	333	577	100	173	2,080	1,007	5,613	5,369
Fishpond (m2)							394	536		
Other land (m2)	22	76	0	0	2,000	3,464	280	502		
Total land (m2)	2,408	1,205	29,500	8,846	7,980	3,920	4,065	4,398	5,853	5,149
Owned with title (m2)	658	1,253	0	0	6,180	5,353	1,311	3,933	240	415
Owned without title (m2)	1,746	3,668	0	0	1,200	2,078	2,080	1,007	5,613	5,369
Rented out (m2)	5	32	0	0	600	1,039	394	535		
Rented in (m2)	775	933	29,167	8,780	3,333	5,774	280	502		
Total(m2)	3,183	3,528	29,167	8,780	11,313	2,214	4,065.56	4,398.51	5,853.33	5,149.96

	Me Linh producers Chains 1, 2, & 3 n=47		*Sapa producers – large Chain 4 n=3*		*Sapa producers - small Chain 5 n=3*		*Me Linh non-producers n=9**		*Sapa non- and new producers n=3*	
Distance from rose fields to main road (m)	399	459	343	271	500	500				
Financial capital needed for rose production next year (1000 VND)	11,875	9,820	2,640	1,455	3,667	2,021				
INCOME (1000 VND)**										
Rose production	25,637	20,804	172,146	140,754	65,856	48,106				
Livestock	989	2,801	0	0	4,693	8,128				
Off-farm activities	1,723	4,521	111,354	192,870	17,798	19,920				
Other flowers	1,747	5,395	0	0	0	0				
Poultry	181	864	0	0	4,224	7,316				
Rice	1,432	4,385	0	0	2,352	4,074				
Rose nursery	1,176	5,145	0	0	0	0				
Vegetables	936	2,435	11,281	19,540	23,412	31,307				
Total income	33,800	28,693	294,781	323,357	118,335	91,555				
Roses produced per farm in the last year	168,497	81,936	483,333	221,886	130,333	84,631				
Value of sold roses per farm in the last year (1000 VND)	45,771	27,672	596,667	326,339	162,300	135,402				

SD = standard deviation
*Not enough information was collected to determine the income of new and non-rose producers.
** For producers, income from rose production was calculated based on reported costs and revenues. Incomes for other activities were up-scaled based on reported shares of income.

Cooperatives
Some rose farms are officially recognized as cooperatives by the Vietnamese government. In 2002, four cooperatives were established for organizational purposes in Sapa (Thien Thanh, Binh Minh, Thanh Xuan, and Hoa Hong). This allowed them to be more effective in both rose production and other businesses.

We interviewed two farmers in Sapa who were part of cooperatives (Binh Minh and Thien Thanh). One is in Chain 5 and one is in Chain 4. These two farms were not grouped and analyzed as cooperatives. In interviews, we found that behaviour of the individual rose producers in the cooperatives was similar to that of other rose producers in the area. The difference between other farms and cooperatives is that in cooperatives three or four farms collaborated to arrange transport and share transport costs to markets in Hanoi or elsewhere. Their way of organising transport was different but in the end the transport cost was the same (van Wijk, et al., 2004).

In an error on our part, little information was collected about this distinction. In the interviews of the six producers in Sapa, only two answered questions about how their roses were delivered. Theirs were picked up at the field or home. There is no evidence of a premium price between the groups as the prices received by the cooperatives were not significantly different than those received by other producers.

Company

The large rose company interviewed in Sapa planted about 50 hectares (ha) with tropical fruit trees at first and in 2001 the company started with roses. In 2004, they had 14 ha of flowers of which, 13.5 were roses. Management estimated that they made a profit of 40% per rose. This company follows a strategy of aiming for the highest quality and destroys 50% of the roses on average, resulting in sales of approximately 2.3 million roses per year.

2.2.2 Intermediaries

Assembler

In our survey of rose producers, 13 of 47 farmers in Me Linh sold their roses primarily to assemblers (9 exclusively, 4 >50%). Two additional farmers from Me Linh sold half of their roses to assemblers and half to wholesalers. These assemblers then resell the roses at wholesale markets or to wholesalers in other provinces. In Me Linh, there are 60-70 assemblers who buy and sell 12,000-25,000 roses per day. From January to March the number increases to 100 (Dang Viet Quang, et al., 2004). Some assemblers are located in Hanoi and some have direct links to farmers in Sapa and Me Linh, but the roses which they buy from farmers are sold to cities and provinces outside of Hanoi. Their role is important, but they are considered to be outside of the scope of this analysis because their roses are sold to consumers outside of Hanoi. Sometimes, wholesalers at Quang Ba buy roses from assemblers, but we are unsure of the source location of these roses.

Box 1 A assembler in Quang Ba wholesale market

Ms. Thu is one of 10 assemblers in Quang Ba wholesale market. She buys and packs flowers in this market and arranges transport to Hai Phong. Buyers (wholesalers and retailers) place their orders ahead of time and the driver delivers the flowers to them in Hai Phong.

The transportation cost is 150,000 VND per room (each truck normally has three rooms inside). She buys about 15,000 roses per day (equal to 300 bunches). Her buying prices are 7,000 VND per bunch of short-stem rose (type II and type III) and 12,000-13,000 VND per bunch of long-stem rose (type I). Her selling price at Hai Phong is 9,000-10,000 VND per bunch of short-stem rose and 14,000 – 15,000 VND per bunch of long-stem rose (Nguyen Viet Cuong, 2005).

Wholesaler

The information in Table 2-4 describes wholesalers at Quang Ba wholesale market. Wholesalers have an average of 2.64 persons per family and a self-reported average income[1] of almost 45 million VND per year, 42% of which can be attributed to roses. Wholesalers, on average, get about half of their total household income from selling flowers. Most wholesalers live near the market, but four live in Me Linh – over 25 km from Quang Ba. They have on average 11.6 years of experience in some form of flower trading. They work approximately 29 days per month. Eight wholesalers worked alone; one worked with another family member; two worked with full time hired labourers; and three worked with seasonal hired labour from 40 to 320 days. Full-time hired labourers are paid an average of 950,000 VND per month and seasonal labourers are paid an average of 70,700 VND per day.

Table 2-4 Wholesaler descriptive statistics

	Mean	Standard Deviation
Age of household head	41.29	5.72
Family size	2.64	0.93
2004 total household income (1000 VND) self-reported	44,930	28,392
Contribution to household income		
Selling flowers (including roses) (%)	51	15
Selling roses, alone(%)	42	29
Worker industrial/services (%)	12	22
Flower cultivation (%)	11	21
Other (%)	10	17
Government official (%)	9	21
Selling other products (%)	5	18
Livestock (%)	2	9
Distance from home to market (km)	10.00	11.45
Experience in flower trading (years)	11.43	4.45
Number of people working at wholesale booth	2.14	2.38
family labourers	1.14	0.36
hired labourers	1.00	2.15
Of which, full-time hired labourers	1.5	0.707
Of which, seasonal labour days	146.7	151
Hired labour monthly wage (1000 VND)	950	40
Seasonal labour daily wage (1000 VND)	40	10
Days per month selling flowers	28.79	2.89
Months per year selling flowers	11.64	0.74
Quantity of roses sold per wholesaler in the last year	1,146,054	446,274
Value of roses sold per wholesaler in the last year (1000 VND)	763,003	451,590

SD=standard deviation

Source: Wholesaler interviews, 2005; n=14

2.2.3 Retailers

Flower shops

Table 2-5 shows that flower shops have the largest self-reported average household income of retailers, 60,000,000 VND per year. About 23% of their household income can be attributed to the sale of roses. As flower shops sell many types of flowers, we note that approximately 67% of their household income comes from flowers. They live near their shops

[1] This is total income as reported in the survey. When we calculate income from roses through net value, we see that the self-reported income is a large underestimate or there was a definition problem when asking the question about incomes..

and have about 10 years of experience in trading flowers. They work with approximately three people of which at least one is hired. Surveys of flower shops show that the average monthly wage of a hired labourer is 500,000 VND. This monthly income is about half of what was reported by the hired labourers we interviewed at flower shops (see Box 2).

Box 2 Hired labourers at flower shops in Hanoi

ProPoor researchers interviewed 16 hired labourers at different flower shops in Hanoi. The workers' specific duties included making bouquets (87.5%), arranging flowers in vases/making wreaths (37%), selling flowers (37%), delivering flowers (12%), and cleaning the shops (6%). They spend about 29% of their time working with roses. Family or friends helped 62% of the workers find employment at the flower shops, while 32% found the job on their own and 7% through an employment centre.

The average worker works 13 hours a day for 6.9 days a week and 11.7 months per year. Most workers get a break of about 7 days for the Tet holiday. All workers are paid monthly and the average salary is 1,043,750 VND per month. Eight workers get bonuses averaging 1,550,000 per year. For 75% of the workers, flower shop owners pay for their food and accommodation. Only two workers have formal contracts (one and three years). Those who were not contracted said that poor job performance or stealing would be the only cause for termination of employment.

Workers say that working in the flower shop is not as hard labour as their previous jobs. It is more comfortable and has a more stable income, but requires longer hours and more precise skills such as those needed for designing bouquets.

If they were not working at the flower shop, over 60% would use the skills they have learned to open a flower shop or continue selling flowers elsewhere, while 30% would farm.

Flower stalls

Flower stall retailers make about 26% of their self-reported household income of 35,000,000 VND from roses and 43% from selling flowers. They live approximately 8 km from where they work. About half of the flower stalls work with a family member. Fifty percent of flower stalls are in official markets but do not rent stalls, while 43% rent stalls. Seven percent are in unofficial markets.

Hawkers

Most hawkers work alone and move door to door selling their roses which contributes to 24% of their income. Flowers in general accounts for half of their household income. They are less experienced than other retailers with an average of six years of experience in trading flowers and live further away from where they work (13.5 km).

Table 2-5 Retailer descriptive statistics

	Flower shops n=15		Flower stalls n=14		Hawkers n=37	
	Mean	SD	Mean	SD	Mean	SD
Family size	2.5	0.7	2.4	0.5	2.3	0.9
Males	1.2	0.6	1.3	0.5	1.0	0.4
Females	1.3	0.6	1.1	0.5	1.4	0.7
Self-reported total income in 2004 (1000 VND)	60000	28763	35293	19170	32892	77055
Contribution to household income						
Rose trading (%)	23	10	26	14	24	17
All flower trading, including roses (%)	66	22	42	15	50	17
Government official (%)	9	8	3	15		
Other (%)	7	7	29	11	26	25
Worker industrial/services (%)	7	4	2	18	5	14
Teacher (%)	5	12				
Selling products (%)	2	14	7	8		
Flower cultivation (%)	2	16	7	19	7	17
Agriculture (%)	1	15	9	19	13	11
Distance from home to this market (km)	1.27	1.71	7.79	8.31	13.55	17.17
Experience in flower trading (years)	9.60	7.29	9.29	5.20	6.26	4.04
Number of people involved	3.07	1.62	1.50	1.29	1.00	0.00
Family members	1.93	1.67	1.50	1.29	1.00	0.00
Hired labourers	1.13	1.25				
Monthly salary of hired labourer (1000 VND)	500	119				
Quantity of roses sold per retailer in the last year	63,417	49,331	115,451	53,280	86,294	48,503
Value of roses sold per retailer in the last year (1000 VND)	127,019	70,279	73,554	27,201	57,450	31,647

SD = standard deviation
Source: Retailer surveys, 2005

Supermarkets
Eleven large supermarkets in Hanoi in May 2005 were visited to investigate if they sold flowers currently, in the past or planning to do so in the future. (see Appendix C). Only one supermarket had ever sold flowers: Big-C supermarket. Of the 11 supermarkets, none had plans to begin or resume selling roses.

Box 3 A flower seller in Big C Supermarket

Ms. Huong manages a flower stall in the Big-C supermarket which currently only sells artificial flowers. She also has a flower shop on Le Hong Phong Street. Initially, she sold fresh flowers such as roses, chrysanthemums and lilies in the supermarket. But she could not sell many flowers and the flowers quickly lost freshness because they sold slowly. She usually sold 1 to 2 bundles of flowers a day. Her customers were usually the staff in the office of Big-C supermarket. She said that there were few customers who wanted to buy flowers in the supermarket. They preferred to buy them from the flower shop. Now she has stopped selling fresh flowers in the supermarket and only sells artificial flowers. She does not have a plan to sell flowers at the moment because it is summer. She may sell fresh flowers in the winter again if she feels a need (Nguyen Dinh Tien, 2005a).

3 Estimations of Actors, Production, and Flows

3.1 Producers

In Dang Viet Quang, et al. (2004), Me Linh commune officials estimated that 300 households specialized in rose production, 300 in rose production and selling, 1500 in rose and cash crop production and 50 in rose production and some other trade. This totals to 2150 farms involved in various intensities of producing roses (Chains 1, 2, and 3).

In van Wijk, et al (2004), Sapa commune officials identified 28 rose producing farms in 2003. Ten were originally from Me Linh and are typically larger farms (Chain 4) and 18 were native to Sapa with smaller farms (Chain 5). Officials also identified 15.5 ha of roses being cultivated by companies. The large rose company had 87 seasonal and 13 full time workers producing roses on 13.5 ha of land. Assuming the remaining companies had similar employment ratios we can estimate that there are 100 seasonal and 15 full time employees working with roses at rose producing companies in Sapa Commune.

Table 3-1 Estimated number of rose producers in Me Linh and Sapa

Chains	*Population involved in rose production*
1,2,3	2150 farms
4	10 farms
5	18 farms
6	100 seasonal employees 15 full time employees

We based estimations of rose production for the researched farmers on the mean productivity of the sampled actors within a particular chain. The example of Me Linh can be seen in Table 3-2. Productivity per ha (867,840 roses/ha) was calculated from the sample and then multiplied by the commune area under rose production in 2003 (200 ha, according to commune officials) to make an estimate of the number of roses produced in that year for the commune (173,567,405 roses). Note that the productivity of farmers in Me Linh is much greater than those in Sapa. This is because different types of roses are grown in each place. Rose plants grown in Me Linh produce more, but smaller, roses than those grown in Sapa. Additionally, roses are grown for only 9 months of the year in Sapa, while those in Me Linh are grown year round. For Chain 6, the large rose company reported growing 2.3 million roses.

The area in rose production in Sapa in 2003, according to commune officials, for Chains 4 and 5 were not distinguished, but rather officials told us that roses were produced by farmers on 55 ha of land. We designated the areas of 33.136 ha and 21.864 ha to Chains 4 and 5, respectively, based on the proportions of farms identified in each chain (10 and 18) and the sample's average farm size for each category (2.875 ha and 0.776 ha).

Table 3-2 Estimated rose production from Me Linh and Sapa

Chains	Actor	Sample Roses Produced (10,000 roses)	Sample Area in Rose Production (ha)	Sample Productivity (10,000 roses/ha)	Commune Area in Rose Production in 2003 (ha)	Estimate of Commune Rose Production (10,000 roses)
1,2,3	Farmers in Me Linh	791.936	9.125	86.784	200.000	17356.7405
4	Farmers in Sapa - large	163.40	5.750	28.417	33.136	941.6509
5	Farmers in Sapa - small	67.10	3.368	19.923	21.864	435.5836
6	Workers in Sapa	230.00	13.500	17.037	15.500	264.0741

Source: Farmer interviews, 2005; van Wijk, et al., 2004; Dang Viet Quang, 2004.

Interviewees identified the actors to whom they sold their roses according to the percentages in Table 3-3. Farmers in Chains 1, 2, and 3 are located near Hanoi and sell their roses to wholesalers, consumers, and retailers located in Hanoi. Local officials reported that half of the roses produced in Me Linh go to Hanoi. The other 50% of buyers of Me Linh roses come from Northern and Central provinces, Ho Chi Minh City and China.

In Chain 4 interviewees reported that 100% of their roses were sold to wholesalers, which are in Hanoi. Of producers surveyed in Chain 5, almost all were sold to wholesalers. According to local government officials in Sapa, 80% of the roses produced by farmers in Sapa are sold in Hanoi (van Wijk, et al., 2004).

A large rose company interviewed for Chain 6 said that all of their roses were sold to six wholesalers in Hanoi. Then 60% of those roses were sold to flower shops in Hanoi, while the remainder went to cities outside Hanoi (van Wijk et al., 2004).

Table 3-3 Flow of roses from producers (% of roses produced)

Chain	*Actor*	*Wholesalers*	*Assemblers*	*Consumers*	*Retailers*	*% to Hanoi (according to local officials)*	*% remaining in Hanoi*
		%					
1,2,3	Farmers in Me Linh	57	24	10	9	50	50
4	Farmers in Sapa from Me Linh	100	0	0	0	80	100
5	Farmers in Sapa	99	0	1	0	80	100
6	Large rose Company	100	0	0	0	100	60

Source: Producer surveys (2004) and van Wijk et al. (2004)

3.2 Wholesalers

There are several wholesale flower markets supplying Hanoi: Quang Ba, Mai Dich, Nga Tu So, Vinh Tuy, Cau Giay, Dong Xuan Street, and Ha Dong, among other smaller ones. According to the management at Quang Ba, it is the largest, holding an 80% share of the market (Wholesale Market Survey, 2004). Quang Ba and Mai Dich are considered large wholesale markets while the others are considered small wholesale markets. The members of a group interview in 2004 estimated that there were 1000 wholesale traders in Hanoi

(Pham and Tran, 2004). The definition of wholesaler in this group interview applied to anyone who sold roses to retailers, including farmer/sellers who brought their roses to wholesale markets. In this paper, we define wholesalers as those who buy and resell roses. They do not produce roses.

To get insight on how important the different wholesale markets are, we use information from the retailer surveys about their particular wholesaler source (Table 3-4). Flower stalls and hawkers bought their roses from more diverse locations than flower shops. Of the retailers we interviewed, 73% got their roses from Quang Ba wholesale market.

Table 3-4 Retailer sourcing from various wholesalers

Wholesaler Location	Flower shops (%)	Flower stalls (%)	Hawkers (%)	Total (%)	Roses in sample
Quang Ba	97	45	80	73	3,117,610
Quang An			1	1	30,100
Mai Dich		8	5	5	194,850
Me Linh		18	0	5	228,900
Nhat Tan	3	9	10	8	349,630
Dam		11	0	3	139,500
Nga Tu So		9	4	5	208,350
Total purchased from wholesalers	100	100	100	100	4,268,940

Source: Retailer Interviews, 2005

In Me Linh commune, there are 230-240 wholesalers who buy and sell 3000-5000 roses/day (Dang Viet Quang, et al., 2005). These wholesalers are farmer/sellers and are not considered specialized rose wholesalers, but rather fit into Chains 2A, 2B, 2C, and 3 under our categorization.

Quang Ba Wholesale Market

According to a group interview at Quang Ba wholesale market, there are between 1000-1300 households which are involved in selling roses there. Of these, 10% buy and resell roses to retailers and are considered specialized rose wholesalers. The remaining 90% both grow and sell roses and come to Quang Ba every two or three days (Dang and Pham, 2005). We interviewed 14 specialized wholesalers. They estimated that there were an average of 127 specialized wholesalers at Quang Ba market and an average of 287 farmer/sellers at Quang Ba per day (a total average of 414 people selling at Quang Ba daily). Farmer/sellers may only come every two to three days leading to a much higher total number. As the average of 414 is much lower than the group interview estimate of 1000-1300, we will be using 100 as the number of specialized wholesalers in future calculations.

Over half of the roses sold by wholesalers at Quang Ba wholesale market are bought from farmers in Tu Liem, according to information from wholesaler interviews in Table 3-5. About 23% come from farmers in Me Linh and 9% from farmers in Sapa. Roses that wholesalers buy from Tu Liem are the cheapest at an average cost of 415 VND/rose, followed by those from other wholesalers, 464 VND/rose; Me Linh, 639 VND/rose; Sapa, 927 VND/rose; and companies, 1161 VND/rose. It should be noted that these costs and selling prices are averages taken over summer, winter, and anniversary days. Wholesalers sell almost half of their roses to flower shops and flower stalls (47%) and the majority of their roses to hawkers (52%). The remainder are sold to consumers. Wholesalers sell higher quality roses to flower shops or stalls for the average price of 693 VND/rose and to hawkers for the average price of 613VND/rose. Note that these are average prices for a variety of types and colours of roses.

Table 3-5 Wholesaler's sourcing, costs, and revenue of roses (sample totals)

	Farmers in Tu Liem	*Farmers in Me Linh*	*Farmers in Sapa*	*Other Wholesalers*	*Companies Sapa (n=2) Hanoi (n=1)*	*Flower shops/ Flower stalls*	*Hawkers*	*Consumers*	*Assemblers*	*Sample Total*
Roses bought (10,000 roses)	826.170	379.826	148.682	220.075	29.723					1604.475
Buying costs (1000 VND)	3425610.5	2425487.9	1378559.1	1020474.5	344977.5					8595109.5
Buying cost/rose (VND)	415	639	927	464	1161					536
Roses sold (10,000 roses)						749.870	827.900	15.455	11.250	1604.475
Revenue from selling (1000 VND)						5195883.25	5071883.2	150035	25650	10443451.5
Selling price/rose (VND)						693	613	971	228[2]	651
% roses bought	51.49	23.67	9.27	13.72	1.85					100.00
% costs of buying roses	39.86	28.22	16.04	11.87	4.01					100.00
% roses sold						46.74	51.60	0.96	0.70	100.00
% revenue from selling						49.75	48.57	1.44	0.25	100.00

Source: Wholesaler interviews, 2005 (N=14).

[2] Only one wholesaler reported selling to an assembler (10% of his roses in the summer and winter).

Table 3-6 shows that of the roses that wholesalers bought from farmers in Me Linh, they sold 54% to flower shops and stalls, 44% to hawkers, and 2% to consumers. Of those roses bought from Sapa, wholesalers sold 48% to flower shops and stalls, 48% to hawkers and 4% to consumers directly.

Table 3-6 Percentage of roses flowing through wholesaler from origin to destination

(%)	*Flower shops and stalls*	*Hawkers*	*Consumers*
Me Linh	54	44	2
Sapa	48	48	4

Source: Wholesaler interviews, 2005 (N=14).

Table 3-7 is based on information from a group interview of wholesalers and the market management staff at Quang Ba Wholesale Market. The group reported that 520,000 – 650,000 roses were sold daily at Quang Ba wholesale market by wholesalers, farmer/sellers, and assemblers. Seventy percent of the roses that come to Quang Ba remain in Hanoi. Others are sold through assemblers to places other than Hanoi (Dang and Pham, 2005). From an interview with a assembler, we know that the average daily sales results in about 5,475,000 roses per assembler per year. There are 10 assemblers at Quang Ba wholesaler market. From individual wholesaler interviews, we know that the average sales are 1,146,054 roses per year and about 100 wholesalers. The remainder of the annual sales at Quang Ba are from farmer/sellers. Therefore, we estimate that 54% of the volume of roses at Quang Ba are sold by specialized wholesaler, 26% by assemblers, and 21 by farmer/sellers.

From wholesaler interviews (see Table 3-5), we calculated that they sold 47% of their roses to flower shops and flower stalls and 52% to hawkers. We assigned 37% to flower stalls and 10% to flower shops based on limitations of the number of flower shops (discussed below). Flower shops reported getting 97% of their wholesale flowers from Quang Ba; flower stalls, 45%; and hawkers, 80%. By this calculation, 179,304,350 roses are sold from wholesalers to retailers in Hanoi in one year.

Table 3-7 Quang Ba wholesale market and total wholesale market annual rose sales (10,000 roses)

	%	*Quang Ba*	*% from Quang Ba*	*All specialized wholesalers in Hanoi*
Average annual sales (10,000 roses)*	100	21352.500		
Assemblers (i.e. leaving Hanoi)**	26	5475.000		
Farmer/sellers	21	4416.964		
Wholesalers***	54	11460.536		
% wholesalers to flower shops****	10	1146.054	97	1181.499
% wholesalers to flower stalls****	37	4210.601	45	9356.891
% wholesalers to hawkers****	52	5913.636	80	7392.046

*Calculations made from information Quang Ba Wholesaler Group Interview (2005)
**Assembler interview (2005)
***Wholesaler interviews (2005)
****Retailer interviews (2005)

3.3 Retailers

The second through fourth columns of Table 3-8 are derived from the retailer interviews according to their sourcing. The last three columns of this table are calculated from information in Table 3-7 about wholesale markets. Using the estimates of the amount sold from wholesalers to retailers, we can estimate the amount of roses retailers get from all sources and their total sales. From this calculation, Hanoi consumers buy 243,619,300 roses per year from flower shops, flower stalls and hawkers. This does not include roses sold directly to consumers from farmers.

Table 3-8 Sources of retailers' roses (% and 10,000 roses)

Source	Flower shops (%) n=15	Flower stalls (%) n=14	Hawkers (%) n=37	Flower shops (10,000 roses)	Flower stalls (10,000 roses)	Hawkers (10,000 roses)	Total (10,000 roses)
Wholesalers	79	76	70	1,181	9,357	7,392	17,930
Other Farmers	17	4	18	261	518	1,921	2,701
Own Farm	0	20	12	0	2,410	1,256	3,666
Dalat – Hasfarm	4	0	0	64	0	0	64
Total	100	100	100	1,506	12,285	10,569	24,361

Source: Retailer surveys, 2005

Only flower shops reported sourcing roses from Dalat Hasfarm. Flower shops interviewed sourced 4% of their quantity of roses from Hasfarm. From this, we estimate that flower shops in Hanoi obtained about 640,000 roses from Dalat Hasfarm in 2004. Neither hawkers nor flower stalls reported to have bought roses from Dalat Hasfarm.

Number of Retailers

Interviewed retailers were asked to estimate the number of retailers on the street or in the market in which they were working. Some respondents were from the same market or street. Taking the average of those responses, we determined a lower-bound estimate of 40 flower shops, 112 flower stalls and 377 mobile hawkers.

On July 17, 2004, Pro Poor researchers counted 111 flower shops in Hanoi. Combining this count with the sampled retailers' estimations (one count overlapped with an estimation), we can estimate that there are approximately 150 flower shops in Hanoi.

From his interviews with retailers, researcher Nguyen Dinh Tien estimated that there are about 500 hawkers on the streets of Hanoi most of whom buy flowers from Quang Ba wholesale market (2005b). Additionally, Dang and Pham estimate that there are a total of 500 hawkers who visit Quang Ba wholesale market (2005). These hawkers do not remain at Quang Ba but rather pick up their flowers and travel throughout the city. We assume that since Quang Ba holds 80% of the market, some 20% of hawkers who buy roses from wholesalers could also visit one of the other wholesale markets in Hanoi. This would lead to an estimation of 625 hawkers who source from wholesalers. From the interviews we know that hawkers also get their roses from their own farms and other farms. Using the percentages in Table 3-8 and the estimation of 625 hawkers sourcing from wholesalers we can estimate that 106 hawkers source from their own farms and 163 source directly from other farmers. This leads us to a total of approximately 894 hawkers in Hanoi.

Another method of estimating the number of retailers is to divide the total sales estimates by the average amount of roses sold by those retailers in our sample. By doing so, we estimate that there are 238 flower shops, 1064 flower stalls, and 1225 hawkers in Hanoi.

Table 3-9 Estimated number of retailers in Hanoi

Retailer	Sample size	Minimum estimate (made by retailers about their streets or markets)	Estimate based on additional information	Estimate based on average and total estimated sales
Flower shops	15	40	150	238
Flower stalls	14	112	>112	1064
Hawkers	38	377	894	1225

3.4 Flow of roses through chains

From our interviews with retailers, wholesalers, and farmers, we learned that consumers in Hanoi are supplied with roses from the areas in Table 3-10. The two sites we studied, Me Linh and Sapa, supplied 33% of Hanoi's roses. Farmers in Tu Liem are popular, supplying 50% of Hanoi's roses, because they are located near Hanoi. Also, over half of the flowers sourced by retailers come from the hawkers or flower stalls who own flower farms in Tu Liem.

Ten percent of Hanoi's roses are supplied by other wholesalers, but we do not know from where they sourced these roses. In Me Linh there are local wholesalers to whom farmers could sell their roses. These wholesalers might sell the roses to other wholesalers at Quang Ba wholesale market and therefore some portion of the 10% of the "Other wholesalers" source could be attributed to Me Linh.

We know that approximately 1% comes from companies, but we do not know their exact location; some are in Sapa, some in Hanoi, and others might be located elsewhere. A small fraction is from Dalat and 4% are from areas near Hanoi and in the neighbouring province of Bac Ninh.

Table 3-10 Sources of roses supplied to Hanoi (%)

Source	*%*
Tu Liem	51
Me Linh	27
Other wholesalers	9
Sapa	6
Bac Ninh, Dien Cai Giay, and Quang Ba	4
Companies	1
Unknown	1
Dalat	1
Total	100

Source: Wholesaler and Retailer surveys, 2005.

Combining information from interviews and estimations made, we have estimated the flow of roses through the investigated rose marketing chains (Table 3-11). Columns 4, 5, and 6 of Table 3-11 are from farmer interviews. Column 7 is from wholesaler interviews. For example, of all roses sold to wholesalers from Me Linh farmers, 43.8% are sold to flower shops and flower stalls and 54% are sold to hawkers.

For Chains 1 and 2, we use the information of the local officials saying that 50% of the roses go to Hanoi. The other 50% goes to Northern and Central provinces as well as to Ho Chi Minh City. Wholesalers, retailers and assemblers may come to Me Linh from these areas, but it is unreasonable to think that consumers would come from those areas. Therefore, we say that 90% of the consumers who buy from farmers in Me Linh are from Hanoi, the remaining 10% are local to Vinh Phuc province or other nearby areas.

In Table 3-11, we include some information that was not in any of the analyzed chains: roses that flow from the farmer to the wholesaler to consumers. This number, even though quite small, must be included to understand the impact of a location (i.e. Me Linh) on the Hanoi rose market.

We have estimated that 243,619,300 roses per year are sold by flower shops, flower stalls and hawkers to consumers (see Table 3-8). If we include the 16,074,100 that are sold directly from farmers in Me Linh to consumers (Chain 3) and the 1,517,500 roses sold from wholesalers to consumers, we get a total of at least 261,239,000 roses sold to consumers in Hanoi. Therefore, our analysis covers 34% of the market of roses sold to consumers in Hanoi. The chain with the largest volume is Chain 1C (10.17% of the Hanoi market) which originates with farmers in Me Linh, includes wholesalers and ends with hawkers. The next largest chain is 3 which leads from farmers in Me Linh to consumers (6.15% of the Hanoi market). Chains 1A and 1B, in which Me Linh farmers sell roses to wholesalers who sell to flower shops and stalls, are next largest covering 4.11% each of the Hanoi market. The largest chain for roses from Sapa was Chain 4C which was 1.73% of the Hanoi market.

Table 3-11 Estimated flow of roses through marketing chains (10,000 roses)

Chain	Estimated amount of roses produced (10,000 roses)*	% to Hanoi **	% to Wholesalers **	% to Retailers **	% to Consumers **	% from Wholesalers to Retailers in Hanoi ***	Amount to Consumers in Hanoi (10,000 roses)	% of Hanoi rose market
1A	17356.74	50	56			22	1073.44	4.11
1B	17356.74	50	56			22	1073.44	4.11
1C	17356.74	50	56			54	2656.64	10.17
FWC	17356.74	50	56		2		98.52	0.38
2A	17356.74	50		9			780.19	2.99
2B	17356.74	50						
2C	17356.74	50						
3	17356.74	90			10		1607.41	6.15
4A	941.65	100	100			24	225.73	0.86
4B	941.65	100	100			24	225.73	0.86
4C	941.65	100	100			48	451.43	1.73
FWC	941.65	100	100		4		38.33	0.15
5A	435.58	100	100			24	209.03	0.80
5B	435.58	100	100			24	104.42	0.40
5C	435.58	100	100			48	209.03	0.80
FWC	435.58	100	100		4		17.73	0.07
6	264.07	100	100			60	158.44	0.61
						Total	8929.49	34.18
						Total Hanoi Market	26123.91	100
						Total through Hanoi retailers	24361.93	

FWC = From farmer through wholesaler to consumer
**From Table 3-2*
***From Table 3-3*
****From Table 3-6*

4 Indicators

To determine the impact of a certain horticulture commodity market chain on poverty we should look at the aspect of generating income for involved actors. In Table 4-1 a number of indicators are presented with regard to the role horticulture commodity chains play in providing livelihoods. For each of the selected commodity marketing chains we will calculate how much labour of one adult is needed to produce, process and market a certain amount (i.e. 10,000 roses) from the field to the consumer. This labour is expressed in full time employment units, which is equivalent to the labour of one adult working 240 days/year.

Table 4-1 Indicators for quantifying the poverty reduction effect of horticulture commodity chains

Abbreviation	*Indicator*	*Definition*
HortiFTE	Horticulture commodity chain full time employment generation indicator	Number of labour units needed to produce, process and market a horticulture commodity from the field to the consumer (in FTE/10,000 roses)
HortiGrossVal	Horticulture commodity chain gross value added generation indicator	Gross value generated by a certain horticulture commodity chain (in US$/10,000 roses)
HortiNetVal	Horticulture commodity chain net value added generation indicator	Net value generated by a certain horticulture commodity chain (in US$/10,000 roses)
HortiValFTE	Horticulture commodity chain net value per capita generation indicator	Net value generated by a certain horticulture commodity chain per FTE involved in this chain (in US$/FTE/10,000 roses)

For an amount of horticulture products we can also calculate what have been the gross value added and the net value added. By dividing the net value added by the FTE needed in the whole chain, we will get an idea of the productivity of the horticulture value chain.

4.1 Chain identification

In Me Linh, 45 rose-producing farmers were interviewed and used in this analysis[3] and in Sapa, 6. All farmers surveyed in Sapa sold their roses to wholesalers. In Me Linh, the buyers were more diversified as shown in Table 4-2. Most farmers (42%) sold exclusively to wholesalers and some (20%) sold exclusively to assemblers. Twenty-two percent of farmers had a more diversified selling strategy.

Table 4-2 Actors to whom farmers in Me Linh sold flowers

Buyers of Me Linh roses	*Assemblers*	*Wholesalers*	*Retailers*	*Consumers*	*Mix*
Number of farms	9	19	3	4	10
% of sample	20	42	7	9	22
Roses sold per farmer (10,000)	11.80	19.49	10.30	11.45	21.08
Productivity (roses/m2)	62.87[a]	94.49	88.35	81.17	112.05[b]
Average cost (VND/rose)	214	125	116	157	126
Average selling price (VND/rose)	371	276	349	253	241

Source: Producer surveys, 2004.
Superscripts indicate significant differences between groups A and B at the 0.05 level.

[3] Two farmers in Me Linh and two in Sapa were interviewed but not used in this analysis because their costs were outliers.

Nine of 10 Me Linh farmers who had a more diversified strategy sold at least 50% of their roses to either wholesalers or assemblers. One farmer sold about half of his production to retailers and half to consumers.

Table 4-3 Combination selling strategies of farmers in Me Linh

Observation	*% quantity to wholesalers*	*% quantity to assemblers*	*% quantity to consumers*	*% quantity to retailers*
Mix1	80			20
Mix2	70			30
Mix3	50		50	
Mix4	50	50		
Mix5	46	54		
Mix6		67		33
Mix7		58		42
Mix8		62	38	
Mix9			47	53
Mix10	10	70	9	11

Source: Producer surveys, 2004.

Following the chains we identified earlier in this paper, observations from farmers in Me Linh that sell exclusively to wholesalers, retailers, and consumers will be used in the chain analysis.

We interviewed 14 wholesalers, one of whom sourced exclusively from other wholesalers. Of the remaining 13, six sourced exclusively from Me Linh or Tu Liem (a peri-urban district of Hanoi Province where roses are also produced). Seven sourced from Me Linh/Tu Liem in the winter and Sapa in the summer. Prices and quantities were reported for each season (summer, winter, and anniversary). Wholesalers are separated into the groups seen below.

Table 4-4 Reported sources of sampled wholesalers' roses

	Me Linh only	*Me Linh/Sapa*
n	6	7
Roses bought/sold per wholesaler (10,000 roses)	136.463**	86.542**
Cost (VND/rose)	428**	659**
Selling price (VND/rose)	490*	841*

Source: Wholesaler survey, 2005.
* indicates means different at the .10 significance level; ** indicates means different at the .05 significance level.

One flower shop sourced exclusively from Dalat and one flower stall sourced equally from farmers and wholesalers. Other retailers sourced either exclusively or primarily (>85%) from farmers or wholesalers. Wholesalers were the most popular source for retailers in our sample. Prices of roses bought from farmers were lower than those bought from wholesalers for all types of retailers. This could possibly be a reflection of the type of flowers purchased and/or a shortened supply chain.

Table 4-5 Reported sources of sampled retailers' roses

Retailer source	*Wholesalers*			*Farmers*		
Retailer	Shops	Stalls	Hawkers	Shops	Stalls	Hawkers
n	12	9	28	1	3	9
Roses bought/sold (10,000 roses)	5.088	10.683	7.401	11.750	9.332	9.939
Cost (VND/rose)	1285[a]	422	485	676	318	313
Selling price (VND/rose)	2572[a]	704	765	1340	704	527

Source: Retailer survey, 2005.
Superscripts indicate significant difference between means of group A and all other groups at the 0.001 level.

4.2 Employment

Full time employment units (FTE) for producers, wholesalers and retailers were calculated from the in-depth surveys which investigated the amount of labour required to add value to 10,000 roses. Information about workers at a large rose company comes from the qualitative interviews. We assume that all producers and workers at the large rose company work eight-hour days. Farmers can be classified in one of the categories found in Table 4-6. Year-round hired labourers in Sapa work nine months out of the year while family labourers work 12 months. There was only one year-round hired labourer employed in Me Linh and she worked for 12 months/year. Seasonal hired labourers are reported from the interview on a per day basis.

Table 4-6 FTE labour days/year for producers

Farm Labour Category	*Number of days/year worked*
Year-round hired labours in Sapa	270
Full-time family labourers	360
Part-time family labourers	180

All workers at a large rose company, full time and seasonal, work in rose production for nine months per year. The full time workers are reassigned to another department of the large rose company for the remaining months of the year. Each worker spends about 30 days per month working in the rose fields. Therefore, each worker spends 1.125 FTE/year in flower production.

Wholesalers reported the number of days per month and months per year they worked. Retailers reported their work schedule with more detail giving the hours per day that they sold roses, as well as the number of days they worked. Each reported the number of hours that they worked selling flowers. We calculated FTEs for roses as a percentage of their total working hours based on the percentage of income they received from roses.

FTEs were calculated for each actor and divided by the number of roses they sold or produced, resulting in what we call HortiFTE. HortiFTEs were then averaged for each chain-actor. Results are shown in Table 4-7. The calculation for HortiFTE is based on that assumption that all flowers grown and marketed by a specific actor required equal marginal labour (i.e. no particular flower grown by one farmer or sold by one wholesaler requires more labour than any other flower that that actor may handle).

From Table 4-7 we can see that for producers, those roses produced by small rose producers from Sapa (Chain 5A) require the most FTE per 10,000 roses (0.88 FTE). Me Linh farmers who sell to farmers (Chain 3) required 0.51 FTEs and workers of companies in Sapa (Chain 6) required 0.49 FTEs to produce 10,000 roses. Large producers in Sapa (4A, 4B, and 4C) are more efficient than small producers in Sapa and as efficient as producers in Me Linh, using the least labour to produce 10,000 roses.

Flowers sold by wholesalers require much less labour than any other actor. This is rather intuitive as buying and reselling of roses requires much less labour than cultivating or peddling roses. Flower shops are the most labour intensive retailers. Flowers that retailers buy directly from farmers in Me Linh require less labour from the retailer than those sourced from wholesalers. This could possibly be because roses sold by farmers to retailers are of lower quality and require less labour on the retailer's part, the farmers might bring the roses to the location of the retailer, or the retailer has an interest in a family rose farm and labour requirement classifications may not be distinct between growing and selling.

Chain 5A requires the most labour to produce 10,000 roses (1.78 FTEs), but covers only a fraction of the market of roses in Hanoi. Marketing chains originating in Me Linh (Chains 1, 2, and 3) require less labour per unit of roses but create the most employment opportunities as there is a larger flow of roses through those chains.

Table 4-7 HortiFTE (FTE/10,000 roses)

	Me Linh							Sapa						
Channel	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3*	*4A*	*4B*	*4C*	*5A*	*5B*	*5C*	6
Actors	*HortiFTE (FTE/10000 roses)*													
Worker														0.49
Producer	0.32	0.32	0.32	0.43	0.43	0.43	0.51	0.32	0.32	0.32	0.88	0.88	0.88	0.02
Wholesaler	0.01	0.01	0.01					0.02	0.02	0.02	0.02	0.02	0.02	0.02
Flower shop	0.88			0.23				0.88			0.88			0.88
Flower stall		0.24			0.14				0.24			0.24		
Mobile hawker			0.14			0.14				0.14			0.14	
Total	1.21	0.57	0.47	0.65	0.57	0.56	0.51	1.22	0.58	0.48	1.78	1.14	1.04	1.41

Table 4-8 HortiGrossVal (US$/10,000 roses)

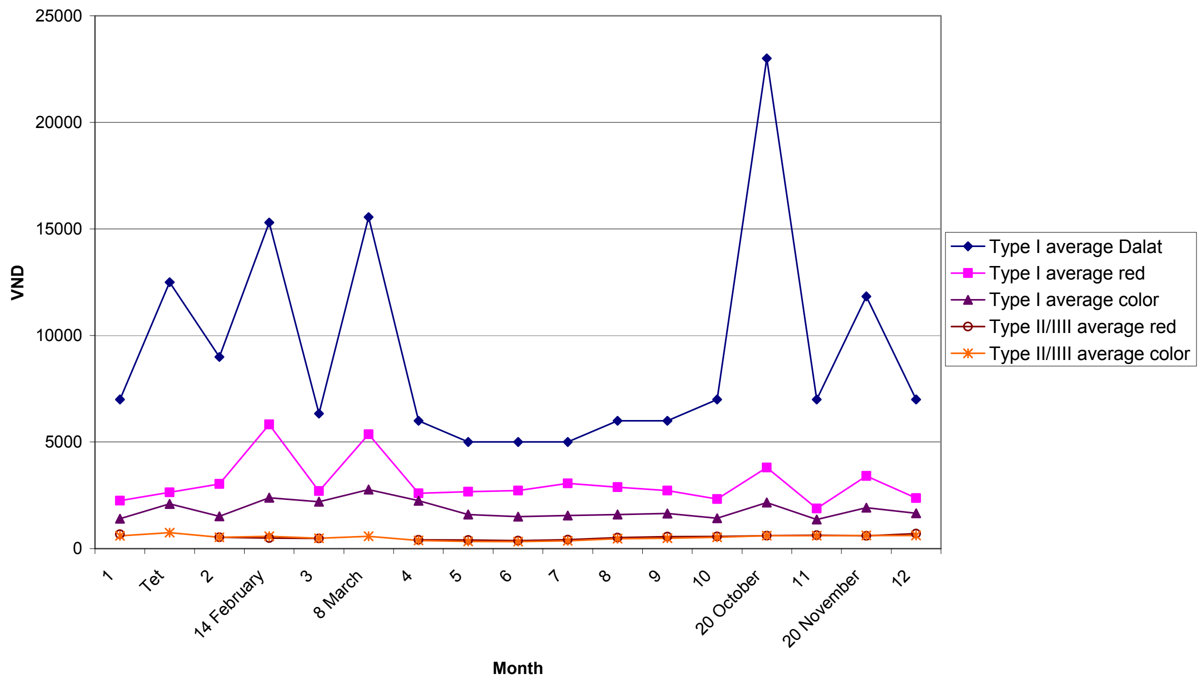
	Me Linh							Sapa						
Channel	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3*	*4A*	*4B*	*4C*	*5A*	*5B*	*5C*	6
Actors	*HortiGrossVal (US$/10000 roses)*													
Worker														252
Producer	178	178	178	225	225	225	163	791	791	791	728	728	728	589
Wholesaler	346	346	346					491	491	491	491	491	491	491
Flower shop	1658			864				1658			1658			1658
Flower stall		454			454				454			454		
Mobile hawker			499			340				499			499	
Total	2182	977	1023	1089	678	565	163	2941	1736	1781	2878	1673	1719	2991

4.3 Gross Value[4]

The indicator of HortiGrossVal (US$/10,000 roses) is used to show how much gross revenue is generated by each chain-actor. For producers, selling prices for roses were reported per month and anniversary day. The management at the large rose company told us in the qualitative interview that they make 40% profit on each rose. Prices for Channel 6 (large rose company), therefore, are based on cost information they provided, about which they (for fear of competition) were not very open and complete. Costs per sao were very low, so we can say that the prices used in Channel 6 here are probably underestimates. Wholesalers categorized roses sold into three groups: winter, summer, and anniversary days. For winter and summer, roses are labelled as red, coloured, or Dalat. Within each of these groups, roses are categorized as type I, II and III[5]. For each combination of classifications (e.g. winter/coloured/type 3), interviewees reported a selling and buying price. Only quantity, buying price and selling price were reported for each of the anniversary days.

Retailers reported prices and quantities monthly and for each of the anniversary days, by colour. Average retail prices for various types of roses are shown in Figure 4-1 Dalat roses bring the highest selling prices, followed by red and coloured roses. Likewise, type I sells at a premium over types II and III. Anniversary prices are noticeably higher for all type I categories.

Figure 4-1 Average retail selling prices



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4 The 2003 annual exchange rate of 15509.6 VND/US$ was used for calculating the gross and net values into US Dollars (ADB, 2004a).

5 Type 1 describes large roses with the branch length of about 1.2 m. Type 2 and 3 are smaller roses with the branch length of about 80 cm.

Gross revenue was calculated in US$ and averaged for a particular chain-actor (see results in Table 4-8). Producers in Me Linh who sell to retailers generate a gross revenue per unit of roses 61US$ and 69 US$ higher than those who sell to wholesalers or consumers, respectively. Large producers in Sapa (Chain 4) make 63 US$ more per 10,000 roses than small producers in Sapa. The company in Sapa generates a gross revenue lower than that of producers in Chain 4. Of all actors, flower shops that bought roses from wholesalers generated the highest gross value per 10,000 roses (1658 US$). They are followed by the flower shops who buy from farmers (864 US$/10,000 roses).

Marketing Chain 6 generates the most gross value per 10,000 roses (2991 US$/10,000 roses). Chains 4A and 5A follow with 2941 and 2878 US$/10,000 roses, respectively.

4.4 Net Value

HortiNetVal (US$/10,000) illustrates the net value created by a chain-actor by producing and/or marketing 10,000 roses. It is calculated using the gross revenue discussed above and the costs calculated in the next section.

4.4.1 Costs

For producers we calculated the depreciated cost of a "package" of first-year inputs, including seedlings. Seedlings have a productive life of seven years, so we used that number in a straight-line depreciation calculation. The costs of a water pump and drilling a well were also reported and we depreciated this over a lifetime use of 20 years with zero scrap value. The two depreciated values (which were reported per sao), are listed as fixed costs in Table 4-9 and were added to the total per sao costs of 2003-2004's production. This was multiplied by the number of sao in rose production and divided by the number of roses to give a per rose cost. This was then assigned and multiplied by the respective number of roses sold in a given chain.

The cost tables below show the mean cost per sao and per rose of producers. A large rose company interviewed preferred not to be open about their costs. Using the information they provided, in this calculation, their costs per sao appear quite low compared to other farmers. Labour costs were largest for the large rose company, while chemical pesticides were the largest cost for other farmers, ranging from 23-45% of total costs. Other large costs were organic fertilizer 13-25% of total costs and fixed costs 11-15% of total costs. Overall, Me Linh farmers have the lowest costs per sao at 258 US$ and farmers in Chain 5 have the highest at 435 US$.

Table 4-9 Producers' costs per sao in 2003

	Chains 1,2,3 (Me Linh)		*Chain 4 (Sapa - large)*		*Chain 5 (Sapa - small)*		*Chain 6 (Large rose company)*	
Input	Mean cost/sao (VND)	% of Total Costs	Mean cost/sao (VND)	% of Total Costs	Mean cost/sao (VND)	% of Total Costs	Mean cost/sao (VND)	% of Total Costs
Total organic fertilizer	984,681	25	843,667	13	1,451,667	22	32,000	1
Total chemical fertilizer	325,351	8	139,000	2	193,917	3	80,000	3
Total fees	70,690	2	386,667	6	51,167	1		0
Hired Labour	102,428	3	857,680	13	852,667	13	2,400,000	87
Rolling paper	179,915	5	161,667	3	93,333	1		0
Chemical pesticides	1,205,213	30	2,886,667	45	1,550,000	23	16,000	1
Land rental	404,468	10	203,667	3	200,000	3		0
Other	121,340	3	0	0	1,600,000	24		0
Fixed costs	602,503	15	929,190	15	757,893	11	221,538	8
Total costs	3,996,589	100	6,408,204	100	6,750,643	100	2,749,538	100
Total costs (US$)	258		413		435		177	

On a per rose basis, the large rose company's costs (448 VND) are lower than other producers in the Sapa area (983 and 680 VND for Chains 4 and 5). Again cost of production is least expensive in Me Linh where it costs 141 VND per rose.

Table 4-10 Producers' costs per rose

	Chains 1,2,3 (Me Linh)		*Chain 4 (Sapa)*		*Chain 5 (Sapa)*		*Chain 6 (Large rose company)*	
Inputs	Mean cost/rose (VND)	% of Total Costs	Mean cost/rose (VND)	% of Total Costs	Mean cost/rose (VND)	% of Total Costs	Mean cost/rose (VND)	% of Total Costs
Total organic fertilizer	35	24	139	14	139	20	5	1
Total chemical fertilizer	12	8	23	2	18	3	13	3
Total fees	2	2	56	6	8	1		0
Labour	4	3	155	16	100	15	391	87
Rolling paper	6	4	25	3	14	2		0
Chemical pesticides	44	31	415	42	169	25	3	1
Land rental	15	10	33	3	23	3		0
Other	3	2	0	0	134	20		0
Fixed costs	21	15	137	14	75	11	36	8
Total costs	141	100	983	100	680	100	448	100
Total costs (US$)	0.009		0.0634		0.0439		0.029	

Table 4-11 shows the gross margin per sao of rose producers in the various chains. Gross margin is calculated as gross revenue minus variable costs. Gross margins were calculated for Chain 6 under two scenarios. Under scenario A, we use information given to us on costs and determine the revenue as a 40% profit for each rose. In scenario B, we use the same cost information but use a selling price of 1500 VND per rose. Farmers in Chain 5 have the largest and Chain 4 has the lowest average gross margin per sao. There are some rather successful farmers from Me Linh and Sapa producing the maximums of 1,382.US$ and 971 US$ in gross margin per sao.

Table 4-11 Producers' gross margin for 2003 (US$/sao)

	Chains 1,2,3 (Me Linh)	*Chain 4 (Sapa)*	*Chain 5 (Sapa)*	*Chain 6 (Large rose company)A*	*Chain 6 (Large rose company)B*
N	45	2	4	1	1
Average productivity (roses/sao)	32,571	6,684	10,150	6,133	6,133
Average Gross Value (VND/sao)	8,977,404	8,018,400	12,061,667	5,604,786	9,200,000
Average Fixed costs (VND/sao)	611,306	1,180,238	506,845	221,538	221,538
Average Variable Costs (VND/sao)	3,456,346	5,958,767	5,367,250	3,141,333	3,141,333
Average Gross Margin (VND/sao)	5,521,058	2,059,633	6,694,417	2,463,453	6,058,667
Min Gross Margin (VND/sao)	524,351	235,500	1,272,000	-	-
Max Gross Margin (VND/sao)	18,360,000	3,629,400	11,381,250	-	-

The average wholesaler buys and sells 1.15 million roses each year, so it is no surprise that their costs average 40,179 US$ with 98.5% of that coming from the cost of buying roses. Costs of preservation, car rental, petrol, repairs, and electricity are the next largest costs.

Table 4-12 Wholesaler's costs in 2004 (n=14)

Input	*Average cost per wholesaler (VND)*	*% of Total Cost*
Cost of flowers	613,936,393	98.52
Other costs[6]	3,760,714	0.60
Preservation costs	2,971,429	0.48
Motorbike depreciation	935,714	0.15
Fee for selling place	934,286	0.15
Cool storage depreciation	548,810	0.09
Nylon packaging	68,571	0.01
Bicycle depreciation	3,929	0.00
Total costs	623,159,845	100
Total costs (US$)	40,178.98	

Total costs were calculated for all actors and then subtracted from the gross value generated by an actor in the respective chain. Averages were made for each chain-actor to get a value for

[6] includes: hiring a car, petrol, repair costs, paying for electricity

HortiNetVal which is shown in Table 4-13. Each of the 100 workers at the Large rose company works for nine months and is paid based on their productivity, which is on average one million VND per month (580 US$/year). This wage is 400,000 VND per month higher than what can normally be earned by workers in the Sapa region. This average divided by the number of roses sold gives the net value of workers in Sapa as 252 US$/10,000 roses. This does not include their housing which is provided as part of their employment contract.

Small Sapa producers (Chain 5) generated the most net value of producers, 337 US$/10,000 roses, followed by workers at the large rose company, 252 US$/10,000 roses. Wholesalers purchasing exclusively from Me Linh generated the least net value per unit of roses, but handle the largest volumes of roses. Chain 6 generated the most net value, followed closely by Chain 5A, then Chain 4A (951, 801, 622 US$/10,000 roses).

4.5 Net value per labourer

HortiValFTE is created by dividing HortiNetVal by HortiFTE to find the value generated per FTE. Producers in Chain 4 add the most value, 647 US$ per FTE, of the producers because they were very efficient with their labour, followed by those in Chain 6, 548 US$ per FTE. Farmers in Chain 3 only added 192 US$/FTE. Wholesalers who source from Sapa in the summer and Me Linh in the winter have the highest HortiValFTE (4176 US$/10,000 roses) numbers because of the high turnover of flowers and the little labour required to sell 10,000 roses. Flower stalls who source from farmers make over 1000 US$ more per FTE than those who source from wholesalers. The chain with the highest HortiValFTE is Chain 6 (Company/wholesalers/flower shops).

Table 4-13 HortiNetVal (US$/10,000 roses)

	Me Linh							Sapa						
Channel	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3*	*4A*	*4B*	*4C*	*5A*	*5B*	*5C*	6
Actors	*HortiNetVal (USD/10000 roses)*													
Worker														252
Producer	97	97	97	150	150	150	62	158	158	158	337	337	337	236
Wholesaler	41	41	41					57	57	57	57	57	57	57
Flower shop	406			185				406			406			406
Flower stall		96			199				96			96		
Mobile hawker			133			106				133			133	
Total	544	234	271	334	349	256	62	622	312	348	801	490	527	951

Table 4-14 HortiValFTE (Net US$/FTE)

	Me Linh							Sapa						
Channel	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3*	*4A*	*4B*	*4C*	*5A*	*5B*	*5C*	6
Actors	*HortiValFTE (Net US$/FTE)*													
Worker														516
Producer	437	437	437	358	358	358	192	647	647	647	548	548	548	482
Wholesaler	3832	3832	3832					4176	4176	4176	4176	4176	4176	4176
Flower shop	977			815				977			977			977
Flower stall		827			1856				827			827		
Mobile hawker			1244			941				1244			1244	
Total	5246	5096	5513	1173	2214	1299	192	5799	5650	6067	5701	5551	5968	6151

Table 4-15 Indicator summary

	Me Linh							Sapa						
Channel	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3*	*4A*	*4B*	*4C*	*5A*	*5B*	*5C*	6
Indicator														
HortiFTE	1.21	0.57	0.47	0.65	0.57	0.56	0.51	1.22	0.58	0.48	1.78	1.14	1.04	1.41
HortiGrossVal	2182	977	1023	1089	678	565	163	2941	1736	1781	2878	1673	1719	2991
HortiNetVal	544	234	271	334	349	256	62	622	312	348	801	490	527	951
HortiValFTE	5246	5096	5513	1173	2214	1299	192	5799	5650	6067	5701	5551	5968	6151

If an FTE is equivalent to working 240 days, then by dividing HortiValFTE by 240 we can see the daily wage rate of actors (hired and family labour) in US$ (see Table 4-16). This does not include the costs of hired labour, which is considered an expense and is not included in the net value. Wholesalers who buy from Me Linh in the winter and Sapa in the summer make the largest net value at 17 US$/day. Farmers in Me Linh make the least net value per day, 1 US$. Large producers in Sapa make the most net value per day of producers, 3 US$/day. Workers at the large rose company make 2 US$/day. Flower stalls that buy roses directly from farmers make the most net value per day of retailers, 8 US$. It is possible that they are sourcing their flowers from a relative or from their own farms. Hawkers who buy roses from wholesalers make 5 US$/day in net value.

Table 4-16 Returns to Labour (Net value US$/labour day)

	Me Linh							Sapa						
Channel	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3*	*4A*	*4B*	*4C*	*5A*	*5B*	*5C*	6
Actors	*Returns to labour (Net Value US$/labour day)*													
Worker														2
Producer	2	2	2	1	1	1	1	3	3	3	2	2	2	2
Wholesaler	16	16	16					17	17	17	17	17	17	17
Flower shop	4			3				4			4			4
Flower stall		3			8				3			3		
Mobile hawker			5			4				5			5	
Total	22	21	23	5	9	5	1	24	24	25	24	23	25	26

According to our estimates, the marketing chains we investigated covered 34% of all roses sold to consumers in Hanoi or over 87 million roses. Table 4-17 shows that the investigated chains employed 6,000 FTEs of people and created nearly 10.4 million US$ in gross value and 2.7 million US$ in net value. For Hanoi totals of FTEs, gross value and net value we upscaled according to Table 3-10, where we assume that Tu Liem, other wholesalers, and Bac Ninh, Dien Cai Giay and Quang Ba are similar to Me Linh; Dalat is similar to Sapa; and the unknown portion (1%) takes an average of all chains investigated. Therefore the entire rose marketing chain supplying roses to Hanoi consumers generated approximately 17,000 FTEs of employment, 27 million US$ in gross value, and 7.4 million US$ in net value.

Table 4-17 Total employment, gross value and net value generated by investigated rose marketing chains supplying Hanoi

Chain	***% of total Hanoi market***	***Amount of roses to consumers in Hanoi (10,000)***	***FTEs (240 days/year)***	***Gross Value (US$)***	***Net Value (US$)***
1A	4	1,073	1,301	2,341,920	584,315
1B	4	1,073	613	1,048,854	251,448
1C	10	2,657	1,251	2,716,412	719,636
2A	1	260	170	283,106	86,950
2B	1	260	148	176,432	90,642
2C	1	260	146	146,844	66,634
3	6	1,607	823	262,450	99,727
4A	0.9	226	275	663,797	140,383
4B	0.9	226	130	391,885	70,387
4C	2	451	216	804,217	157,303
5A	0.8	209	373	601,604	167,336
5B	0.4	104	119	174,732	51,208
5C	0.8	209	218	359,293	110,174
6	0.6	158	223	473,936	150,750
Subtotal (34%)	34	8,775	6,007	10,445,481	2,746,893
Sapa	5	1,425	1,332	2,995,527	696,792
Me Linh	28	7,191	4,452	6,976,017	1,899,352
Tu Liem	51	13,323	8,249	12,924,685	3,518,988
Other wholesalers	9	2,351	1,456	2,280,827	620,998
Bac Ninh, Dien Cai Giay, and Quang Ba	4	1,045	647	1,013,701	275,999
Dalat	1	261	244	549,016	127,707
Unknown	1	261	179	310,974	81,778
Companies	1	261	367	781,414	248,553
Total (100%)	100	26,124	16,926	27,832,160	7,470,166

*Chains 2A, 2B, and 2c's collective total is 7,801,900 roses.

By looking at the selling prices of the various actors in the marketing chains we can see what percentage each received of the consumer price. The highest consumer prices were for roses bought at flower shops, ranging from 1340-2520 VND per rose. The least expensive roses were those sold directly to consumers from farmers in Me Linh at 253 VND per rose. Producers in Me Linh who sold to other actors received 15-59% of the consumer price and in Sapa they received 47-76% of the consumer price. Wholesalers captured 4-10% of the consumer price. Flower shops were successful at adding value and capturing 49-79% of the consumer price. Flower stalls (17-55%) and hawkers (17-45%) received a little less than flower shops.

Table 4-18 Percentage of consumer price

Chain	*1A*	*1B*	*1C*	*2A*	*2B*	*2C*	*3*	*4A*	*4B*	*4C*	*5A*	*5B*	*5C*	6
Consumer price	1628	622	621	1340	704	527	253	2617	1611	1611	2520	1514	1514	2304
%														
Producer	17	44	44	50	45	59	100	47	76	76	45	75	75	40
Wholesaler	4	10	10					4	6	6	4	7	7	4
Flower shop	79			50				49			51			56
Flower stall		45			55				17			19		
Mobile hawker			45			41				17			19	
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

5 Importance of Rose Production and Marketing in Livelihoods

In order to understand the importance of roses in the livelihoods of involved actors, we will look at their dependence on rose production/marketing and their alternative livelihoods. For rose producers, we also look at several alternative livelihood scenarios and their impact on household income were they to replace rose production. Additionally, we will discuss the amounts and sources of capital needed for rose production.

5.1 Share of Income from Rose Production and Marketing

Local officials identified households as poor, moderate and rich prior to our interviews. In Me Linh, 13 of the interviewed farmers relied solely upon roses for income. For another 13 farmers, 70% of their income came from roses. In Me Linh, all poor and all rich households received at least 50% of their income from roses. In Sapa, all farmers relied upon roses for at least 50% of their income (see Figure 5-1).

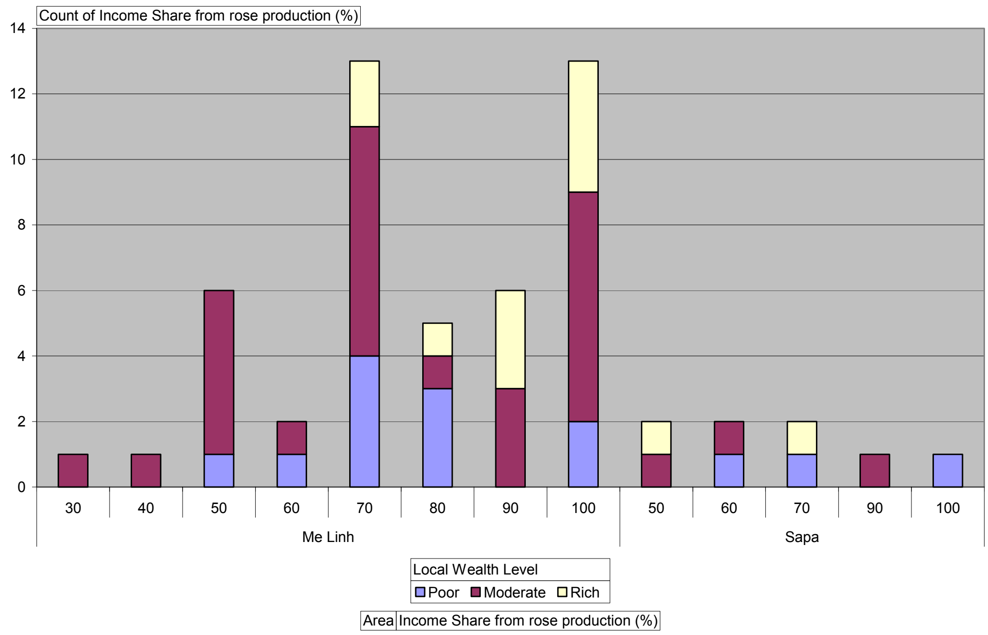

Figure 5-1 Income share of rose production for poor, moderate, and rich farmers in Me Linh (n=47) and Sapa (n=8)

Retailers, on the other hand, depended less on rose selling as a share of their income. Only six retailers relied on roses for 50% or more of their income, five of whom were mobile hawkers. Retailers often sell multiple types of flowers and few are completely reliant on only roses for their income (see Figure 5-2). Additionally, other family members often have jobs outside of flower retailing, making flower trading only a portion of household income.

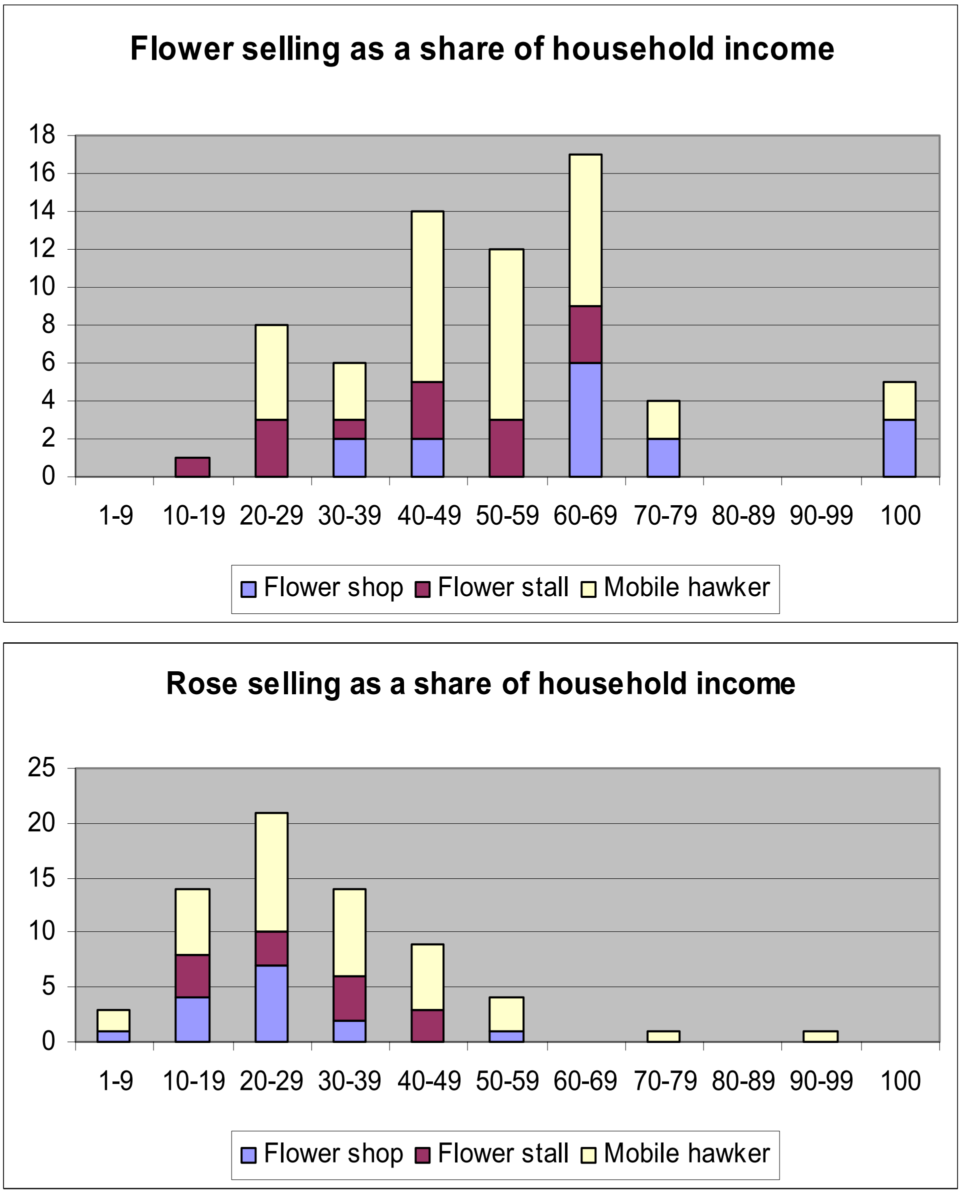

Figure 5-2 Income share of flower and rose selling for retailers (n=67)

5.2 Alternatives to Rose Marketing

Producers reported a variety of alternatives they would pursue if they did not produce roses. Over half would do some other type of farming work. The most popular response was to switch from growing roses to vegetables. Four people (7%) in the Me Linh area think that growing ornamental plants would be a viable alternative to roses while 18% of farmers in Me Linh would seek off-farm employment, mostly starting a small business, as an alternative to growing roses. Over one quarter of the respondents could not report an alternative. They would continue to grow roses or sell their land.

Table 5-1 Alternative livelihoods for farmers (%)

		Producer Chain (%)			
Category	Alternatives Category	1,2,3 n=47	4 n=3	5 n=4	Total
Farming	Grow cash crops	2	0	0	2
	Grow ornamental plants	9	0	0	7
	Grow other flowers	0	33	0	2
	Grow vegetables	36	33	0	33
	Grow vegetables and animal husbandry	0	0	25	2
	Grow vegetables and forest	0	0	25	2
	Grow vegetables and fruit trees	0	0	25	2
	Grow vegetables and paddy	6	0	0	6
	Grow vegetables, animal husbandry, and small business	2	0	0	2
	Grow vegetables, fruit trees and medicinal plants	0	0	25	2
Farming Total		55	67	100	59
Off Farm Work	Hired labourer	4	0	0	4
	Sell roses	2	0	0	2
	Services	2	0	0	2
	Small business/trade	9	0	0	7
Off Farm Work Total		17	0	0	15
Other	Continue to grow roses	4	0	0	4
	Does not Know	9	0	0	7
	No answer	13	33	0	13
	Sell his land	2	0	0	2
Other Total		28	33	0	26
Grand Total		100	100	100	100

A third of the hawkers interviewed would work on farms or with agriculture in some way if they were not selling roses (see Table 5-2). Currently many hawkers source their roses from their own farms or farms of family members, so returning to the farm seems like a reasonable alternative to them. Nineteen percent of hawkers said they would become hired labourers, cleaning houses or working in a store. Over half of the flower shops would use their resources to open a shop or restaurant or begin selling food or goods. Eight percent of all retailers interviewed said they would be unemployed and 9% retailers said they did not know what they would do.

Table 5-2 Alternative livelihoods for flower retailers (%)

		Retailer (%)			
Category	*Alternatives*	*Flower Shop n=15*	*Flower Stall n=14*	*Hawkers n=36*	*Grand Total n=65*
Begin a new enterprise	Open a restaurant	7	0	3	3
	Open juice and drink shop	7	7	3	5
	Open shop to sell goods	7	0	0	2
	Rent out her shop	7	0	0	2
Begin a new enterprise Total		27	7	6	11
Farm	Farm	0	7	14	9
	Farm and animal husbandry	0	0	3	2
	Farm/hired labour/selling goods	0	0	3	2
	Grow flowers	0	7	8	6
	Grow vegetables	0	0	6	3
	Grow vegetables and flowers	0	7	0	2
Farm Total		0	21	33	23
Hired labourer	Do housework	0	0	6	3
	Hired labourer	0	0	6	3
	Hired labourer/sell goods	0	0	8	5
Hired labourer Total		0	0	19	11
Other	Care for her child	0	0	3	2
	Does not know	7	14	8	9
	Retire	0	7	0	2
	Return to hometown	7	0	0	2
	Stay at home	0	21	3	6
	Stay at home/care for grandchild	0	0	3	2
	Unemployed	13	7	6	8
Other Total		27	50	22	29
Selling	Continue to sell flowers	7	0	3	3
	Sell fruit	13	0	3	5
	Sell goods	7	7	0	3
	Sell pork	0	7	0	2
	Sell sticky rice cakes	0	0	3	2
	Sell vegetables	0	7	0	2
	Sell vegetables or fruit/hired labourer	0	0	3	2
Selling Total		27	21	11	17
Skilled labourer	Become a wedding photographer	7	0	0	2
	Embroider	7	0	0	2
	Tailor	7	0	6	5
	Tailor or barber	0	0	3	2
Skilled labourer Total		20	0	8	9
Grand Total		100	100	100	100

5.3 Livelihood Scenarios and Poverty Assessment

To assess the impact of rose production and marketing on poverty, we look at alternatives to rose production for farmers and their associated incomes. We compare producers' current levels of income and that of six alternatives. Scenario A switches the land in rose production to vegetable production (for Me Linh, two crops of vegetables and one crop of rice; for Sapa, two crops of vegetables) and Scenario B, from rose to paddy rice (in Me Linh, two crops of rice, one of vegetables; in Sapa, one crop of rice). In these two scenarios, all else is held constant, including the current amount of off-farm income. Information on gross margin per sao is taken from the VEGSYS project[7] in Dong Anh district of Hanoi. These numbers may not reflect gross margins in Sapa, but we applied them anyway because we lacked region specific data. The gross margin for vegetables is the average of gross margins for kohlrabi, wrapped heart mustard, wax gourd, choysum, tomato, cabbage, cauliflower, and French beans.

Table 5-3 Livelihood scenarios for producers

Scenario	*Gross margin per sao in Me Linh (VND)*	*Gross Margin per sao in Sapa (VND)*	*Annual income per capita Sapa (VND)*	*Annual income per capita Me Linh (VND)*
A: rose to vegetables	1,148,596	898,792		
B: rose to paddy rice	949,004	249,804		
C1: rose to skilled worker in agriculture, forestry and fishery			5,866,680	5,922,360
C2: rose to non-farm work - services			10,415,160	11,652,480
C3: rose to non-farm work - trade			7,746,600	12,277,200
C4: rose to non-farm work - unskilled workers			4,544,400	6,000,840

* Agricultural production information from VEGSYS project. Salary information from GSO (2004).

Scenarios C1, C2, C3, and C4 hypothesize that farmers would no longer produce roses and that the full time labourers involved in producing roses would be employed as skilled workers in agriculture, services, trade or as unskilled workers. We assume that part time labourers once involved in rose production would be unemployed and that total household income consisted entirely of income of off-farm work (i.e. no continuing paddy or vegetables if currently doing so). Table 5-3 shows the annual income per capita for each region if they employed under those scenarios. This information was taken from Vietnam Household Living Standard Survey (GSO, 2004). Information for Sapa was taken from the reported numbers for the Northwest and for Me Linh from the Red River Delta.

The following annual per capita poverty rates were used in calculation of indicators: poverty line calculated by the expenditure approach 2002 (1,920,000 VND), 1 PPP$/day 2002 (1,115,404 VND), 2 PPP$/day 2002 (2,230,807 VND). The later two are calculated from the PPP deviation of 5 for Vietnam (i.e. 1 US$ could buy fives times as much in Vietnam than it could in the US). All information about poverty rates and gaps for Vietnam comes from the "Vietnam Development Report 2004: Poverty" by the World Bank (2004b).

The results are shown in Table 5-4 along with a sensitivity analysis of 20% less income from a source. Note that currently 15% of the farmers in Me Linh fall under the expenditure approach poverty line. In Scenarios A and B, Me Linh producers are worse off than they are in their current situation. Fifty-five percent of Me Linh producers who might switch to rice

[7] See www.vegsys.nl

production would be under the expenditure approach poverty line. All but 2% of Me Linh farmers who switched to services or trade would be lifted from poverty. If they were employed as skilled agricultural workers or unskilled labourers, fewer would be below the 1 PPP$/day poverty line, but more would be below the 2 PPP$/day line. The sensitivity analysis looks at the scenario producing 20% less income. In both cases, the best alternative for producers in Me Linh is off-farm employment in trades or services.

Currently, all rose producers in Sapa are above the three measures of poverty used here. If they left rose production to become skilled agricultural labourers, traders or unskilled labourers, some would be considered in poverty. Rose producers in all locations have alternatives that could lift them from poverty if they were in poverty.

Table 5-4 Results of Poverty Assessment of Livelihood Scenarios (% below poverty line)

Scenario	*Poverty Measurement*	*Me Linh 1, 2, 3 n=47*	*Sapa 4 n=3*	*Sapa 5 n=3*	*Me Linh*	*Sapa 4*	*Sapa 5*	*Vietnam*
					Sensitivity Analysis (-20%)			
Scenario A	1 PPP$/day	15	0	0	28	0	0	12
	Expenditure Approach	45	0	0	55	0	0	29
	2 PPP$/day	62	0	0	68	0	0	56
Scenario B	1 PPP$/day	21	0	0	34	0	0	12
	Expenditure Approach	55	0	33	62	0	33	29
	2 PPP$/day	68	0	33	70	0	33	56
Scenario C1	1 PPP$/day	2	0	0	4	0	0	12
	Expenditure Approach	13	33	0	36	33	67	29
	2 PPP$/day	19	33	33	38	33	67	56
Scenario C2	1 PPP$/day	2	0	0	2	0	0	12
	Expenditure Approach	2	0	0	4	0	0	29
	2 PPP$/day	2	0	0	4	33	0	56
Scenario C3	1 PPP$/day	2	0	0	2	0	0	12
	Expenditure Approach	2	0	0	2	33	0	29
	2 PPP$/day	2	33	0	4	33	33	56
Scenario C4	1 PPP$/day	2	0	0	4	33	0	12
	Expenditure Approach	13	33	67	19	33	67	29
	2 PPP$/day	19	33	67	38	33	67	56
Current Status	1 PPP$/day	11	0	0				12
	Expenditure Approach	15	0	0				29
	2 PPP$/day	15	0	0				56

To assess the livelihoods of other actors, we can look at their average current income from roses per capita. Income from roses per capita is calculated from net revenues for all actors. In Table 5-5, we see that producers have larger families than wholesalers or retailers. Wholesalers, by far, have the highest per capita income from roses at over 22,000 US$. Of producers, those in Chain 4 have the highest average income from roses, while flower shops have the highest average income of retailers. Roses generate the greatest share of income for producers in Me Linh (79%) and the least for flower shops (23%). The average actor in the chains investigated received enough income per capita from roses alone to remain above the poverty lines (expenditure approach, 124 US$; 1PPP$/day, 72 US$; 2PPP$/day, 144US$). Averages do not show that there may be individuals below a measure of poverty. There are seven farmers in Me Linh currently below the expenditure approach poverty line when all income is considered. Currently, none of the wholesalers or retailers are in poverty when all income is considered. It should be noted that when wholesalers and retailers were asked to estimate their total income, all underreported compared with our calculations[8].

Table 5-5 Average incomes and incomes from roses for all chains

US$	*Producers in Chains 1, 2, and 3*	*Producers in Chain 4*	*Producers in Chain 5*	*Workers at company*	*Wholesalers*	*Flower shops*	*Workers in flower shops*	*Flower stalls*	*Hawkers*
Average family size	5.00	4.37	6.00	-	2.64	2.50	-	2.36	2.34
Average share of income generated by rose production (%)	79	75	58	-	42	23	-	29	33
Average income from roses	1611	8201	4947	580	20,814	2020	843	1385	1003
Average income from roses per capita	322	2167	877	-	9,292	810	-	661	540
Average roses sold (10,000)	16.46	48.33	13.03	2.3	114.61	6.34	-	11.55	8.63

Source: Producer surveys, 2004; wholesaler and retailer surveys, 2005

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8 Our calculations were made based upon all the input-output data which were given by each of the actors during the survey

5.4 Capital necessary to be involved in rose production

For next year's rose production, farmers reported the figure they felt necessary. Producers in Me Linh need 140 US$/sao, and those in Sapa needed 170 US$/sao and 236 US$/sao. All of the producers in Chain 4 will attain their needed capital from savings. Of small farmers in Sapa two will get the needed capital from savings and one will take a loan from a bank . Over half of the farmers in Me Linh will tap savings for next year's capital, 18% will get loans from the bank and 13% will get loans from relatives.

Table 5-6 Capital needed per sao and sources

	Me Linh Chains 1,2,and 3	*Sapa Chain 4*	*Sapa Chain 5*
Capital needed (VND/sao)	2,168,222	2,640,000	3,666,667
Capital needed (US$/sao)	140	170	236
Source of capital (% of farmers answering)			
Savings	55	100	66
Loans from bank	18	0	33
Returns from previous year	7	0	0
Loans by relatives	13	0	0
Credit fund	4	0	0
Purchasing materials on credit	4	0	0

Source: Producer interviews, 2004.

6 Conclusions and Recommendations

The rose marketing chain supplying roses to Hanoi consumers generated approximately 17,000 FTEs of employment, 27.8 million US$ in gross value, and 7.4 million US$ in net value in 2003-2004. This horticulture marketing chain is important in creating jobs and income for people in northern Vietnam. Rose producers rely heavily on rose production as a source of income. In Me Linh, all poor and all rich households received at least 50% of their income from roses. In Sapa, all farmers relied upon roses for 50% or more of their income. Retailers, on the other hand, were less reliant on rose selling's contribution to their income, but were dependent on flower retailing for an average of 50% of their income, with 5% of retailers being completely dependent on flower selling. Five hawkers, who had the lowest income per capita of retailers, relied on roses for 50% or more of their income (four of them relied on flowers for 65-75% of total income and one relied solely on flowers).

Currently, of all the actors we analyzed, only 15% of the farmers in Me Linh were in poverty according to the expenditure approach of poverty measurement. Farmers depend upon rose production for 79% (in Me Linh) and 58-75% (in Sapa) of their income. If farmers in Me Linh would not be able to produce roses and switched back to vegetables or rice (which they were doing less than 9 years ago), 45 and 55% would be below the poverty expenditure line. From this we tentatively conclude that of our sample farmers in Me Linh 30% were lifted out of poverty by switching to rose cultivation.

This analysis also looked at the efficiency of actors in producing net value with their available labour. Large producers in Sapa (Chain 4) added the most value, 647 US$ per FTE, of the producers because they were very efficient with their labour, followed by the large rose company (Chain 6) with 548 US$ per FTE. Farmers in Me Linh who sold to consumers only added 192 US$/FTE. Wholesalers who sourced from Sapa in the summer and Me Linh in the winter have the highest HortiValFTE (4176 US$/10,000 roses) number because of the high turnover of flowers and the little labour required to sell 10,000 roses. Hawkers earn 303 US$ net more per FTE when they buy from wholesalers rather than directly from farmers and flower shops earn 162 US$ more per FTE when doing so. Flower stalls who sourced from farmers made over 1000 US$ more per FTE than those who sourced from wholesalers. This is because many flower stalls own rose farms as well (2 of the 3 stalls who source from farmers in our sample, source from their own farms). The chain with the highest HortiValFTE was Chain 6 (Company/wholesalers/flower shops).

To determine which value chain is most “Pro Poor” it is important to know what wholesalers will do with their profit (multiplier effect). If farmers can not organise sales to flower retailers in a different way then they do now currently, farmers get a higher net value per FTE when they sell to wholesalers, compared with directly selling to retailers. At the current scale, value chain 1 seems to be most pro poor, as the hired labourers which are attracted by chain 6 are currently not the poorest. Actually the workers at the flower company are innovators who are there to learn. But when the cultivation area expands and more people will be employed, it is expected that also the poorer will join.

Therefore, developing rose value chains in cooler mountainous areas, targeting the hot summer period, has a lot of poverty reduction potential, as they generate employment in relatively remote rural areas. To make this option even more attractive, experiments should be done to see if with cheap plastic greenhouses the production period can be extend in the colder winter months. An interesting option could be to stimulate the company and out growers scheme model. Attracting foreign direct investment could speed up developments and give access to export markets.

The high use and especially misuse of pesticides for rose production is one of the most important disadvantages. This is especially a worry if this happens at large scale in the relatively unspoilt and fragile mountainous areas, where people still rely on surface water for drinking. It is crucial that applied research with farmers develops more sustainable cultivation alternatives.

Compared with growing other cash crops such as vegetables, rose cultivation requires more capital. Especially the first year is hard when investments have to be made in rose seedlings and a well, if irrigation water is not reliable. In Me Linh first year investments are about 4 million VND per sao (262 US$/sao). The poorer farmers can only take this step if they have access to credit. For Me Linh this certainly has been the case, as shown in the past 10 years (see Dang Viet Quang, 2004a). This might be different for ethnic minority farmers in Sapa. Hawkers require little capital to sell roses and they can recover their costs quite easily making 4-5 US$ for each day they work.

In Sapa another barrier to entry could be the need to have relations with traders in Hanoi, as currently no traders come to Sapa themselves. Orders are placed by wholesalers through telephone. Many of the current rose farmers have a background in rose cultivation in Me Linh and good links with traders. For H'mong farmers this might be a barrier as they do not yet have these links. But we expect that in the near future the current rose farmers and companies in Sapa will start out growers schemes. They will provide knowledge and buy the roses from farmers who do not have direct links with traders in Hanoi.

When a rose sector policy is designed, market saturation should always be kept into account. Vietnamese farmers have had bad experiences in the recent past, when their to eager adoption of a new cash crop led to a rapid reduction of prices (f.e. coffee). Unfortunately, no domestic rose consumption data are available, so no estimate can be made of the growth of the domestic market. According to the focus group discussions with farmers in Me Linh, profitability per sao has dropped from VND 8 million in 1993 to VND 5 million per sao in 2004 (Dang Viet Quang *et al.*, 2004a). Farmers expect profitability to further decrease to VND 3.5 million in 2010. The main reasons for this decline are the increased problems with pests and diseases (lower yields and more pesticides are needed), increase in input costs and a decline in prices for roses. This decline indicates that growth in supply has been catching up with the growth in demand.

According to estimates by key-informants the price for “Sapa roses” is expected to decline when the production area reaches 70 hectares. The total demand from the Northern market is expected too be satisfied when 250 hectares of roses are cultivated in Sapa (Dang Viet Quang *et al.*, 2004b).

This market saturation can be prevented by diversifying in types, colours of roses and possible other flower cultivation. In addition export markets should also be developed. The foreign owned DALAT HASFARM has shown that this is certainly possible to do from Vietnam. Till date Vietnamese roses from Northern Vietnam have hardly been exported, only sometimes to China. Cost price per rose is very competitive, but quality will have to improve a lot. More emphasis should be on extending the vase life of the rose. There is a lot of scope for quality improvement, as till now farmers have only had very limited access to research and extension. Through variety trials, integrated pest management and developing cheap plastic green houses a lot can be done to improve.

Besides making choices between different chains within a subsector, the methodology can also be used to compare different sectors. In which subsector would government or donor funding result in the highest employment generation and participation of the poor? Future research could explore more opportunities in selling roses from supermarkets, rose export markets, and Dalat's impact on the Hanoi rose market.

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Appendix A Supermarkets

Table 6-1 Supermarkets sampled, May 2005

Supermarket	*Address*	*Do they currently sell flower?*	*Have they sold rose in the past?*	*Will they sell rose in the future?*
Big-C Supermarket	208 Tran Duy Hung	No	Yes	Do not have plans to continue
Marko Supermarket	379 Tay Son	No	No	No
Seiyu Supermarket	8 Pham Ngoc Thach	No	No	No
Vinaconex Supermarket	24 Hai Ba Trung	No	No	No
Vinaconex Supermarket	Trung Hoa- Nhan Chinh building	No	No	No
Intimex Supermarket (includes 3 units)	26 Le Thai To	No	No	No
Fivimark Supermarket (includes 3 units)	210 Tran Quang Khai	No	No	No
Family Supermarket	152A Lac Trung	No	No	No
Vincom Supermarket	Building Ba Trieu	No	No	No
Ha Noi's Food Company	144H Giang Vo.	No	No	No
Supermarket No 5 Nam Bo	5 Le Duan.	No	No	no

Appendix B Retailer Estimations

Table 6-2 Average estimates of number of retailers in a market/street by retailers interviewed

District	*Market or street*	*Hawkers*	*Flower Stalls*	*Flower Shops*
Ba Dinh	Chau Long market	20	2	
	Cua Nam market	10	3	
	Hoe Nhai market	4	1	
	Long Bien market	5		
	Ngoc Ha market	4	6	
	Ngoc Ha street	10	5	
	Quan Thanh street	10	4	
	Thanh Cong A market	20		2
Cau Giay	Cau Giay street		4	
	Nghia Tan market/street	8	11	
Dong Da	Kham Thien street		6	
	Lang Ha market	15		6
	Lang Ha street	35	3	
	Nga Tu So market			5
	Ton That Tung street		1	
	Van Chuong street	5	2	4
Hai Ba Trung	19-12 market	5	3	
	Bach Khoa market	15	1	
	Dong Tam market	15		2
	Hai Ba Trung street		8	
	Lo Duc street	20	2	
	Mo market	20	8	
	Nguyen Cong Tru market	6		
	Nguyen Cao market	10	2	
	Tran Xuan Soan street	20	6	6
	Truong Dinh market	1	2	
Hoan Kiem	Cho Gao street	2	1	
	Dang Thai Than street	5	1	5
	Dong Xuan market	6		
	Hang Ga street	30		
	Hang Non street	10	2	
	Le Duan street	2	2	
	Phan Huy Chu street	10	2	
Tay Ho	Buoi street		5	
	Hoang Hoa Tham street	1		
	Lac Long Quan street	13.33	3.5	
	Nhat Tan market	5.33	5	5
	Xuan Dieu street	3		
	Yen Phu street	15		
Thanh Xuan	Bui Xuong Trach street		1	
	Nguyen Quy Duc street		3	
	Nguyen Trai street		2.5	
	Quan Nhan street	2		
	Thuong Dinh market	15	4	5
TOTAL		377.66	112	40

Appendix C Retailers' Motivations for Flower Selling

Table 6-3 Retailer responses to "Why do you sell flowers?"

Retailer	*Number of Responses*	*Reason for selling flowers*	*Statements*
Flower Shops	6	ENJOYMENT	I like the trade.
			Selling flowers is my favourite job.
	4	SKILL	I am skilled in selling flowers.
			I have experience in selling fruit and flowers.
	4	TRADITION	My parents taught to me how to sell flowers.
			This has been our family business for many years.
			I was born in Quang Ba and have always loved selling flowers.
	2	NO ALTERNATIVE	I have income when I'm selling flowers.
			I have no other job.
	2	MARKET OPPORTUNITY	I have a shop and the shop next door was selling flowers, so I began to sell flowers, too.
			My husband cultivates flowers and we can earn more money when I sell flowers compared to the other jobs I can have.
	2	LOW INVESTMENT	Little capital is necessary and I have a regular income by selling flowers.
			Not so much capital is needed and it is easily recovered.
	1	CONVIENIENCE	Selling flowers is suitable for family.
Flower Stalls	5	CULTIVATE FLOWERS	My family also grows flowers.
			I live in a village where flowers are cultivated.
	4	ECONOMIC	Selling flowers has higher income than other goods.
			Selling flowers give more income and I can sustain my life longer.
			I can recover capital in one day when selling flowers.
			I have little capital and selling flower is easier than other trades.
	4	NO ALTERNATIVE	I have no other job.
	3	EXPERIENCE IN SELLING	I sold lotus before I switched to selling roses.
			I retired from selling groceries and now I'm selling flowers.
			I have been selling flower for 10 years and I like it.
	2	ENJOYMENT	I like selling flowers.
Hawkers	6	CULTIVATE FLOWERS	I cultivated vegetable before then I shifted to cultivating flowers.
			My family is growing flowers.
			My village cultivates flowers as traditional work.
			I grew tomatoes and rice before but I shifted to growing and selling flowers.
	6	RETIRED/ FREE TIME	I am retired already and have nothing to do.
			I want to take advantage of my free time.
			I had no job, so I go to sell flowers.
	5	INCREASE HOUSEHOLD INCOME/STABLE	I want to earn more money to help my family.
			I sold vegetables before but it was not enough money for my family to spend.

Retailer	*Number of Responses*	*Reason for selling flowers*	*Statements*
		INCOME	Our earnings [from other jobs] are not enough for different expenses.
			My neighbour told me selling flowers has a stable income.
	4	BETTER THAN ALTERNATIVE	Selling flowers is easy and creates more income than selling fruit.
			Selling flowers is an easier life than being a tailor.
			It was very difficult to earn a living in my homeland. So I go selling flowers.
	4	LOW INVESTMENT	There is no rent required for selling flowers, so I need less capital.
			Not much capital is needed and it is not hard work
			I can recover my capital in one day.
			Before I traded fruit but my capital ran out, so I sold flowers.
	3	LOST JOB	I was unemployed because my company went out of business so I go to sell flowers.
			I worked in a knitting company before, but the company went out of business, so now I sell flowers.
			I was unemployed because my company was out of business.
	3	NO ALTERNATIVE	I have no job, so I have to sell flowers.
			We haven't more land to cultivate, so I sold roses.
	1	CONVIENIENT	I can work in my off-duty hours.
	1	ENJOYMENT	I like it.
	1	OTHER	A chemical substance wrecked the outer skin of my hand.
	1	TRADITION	My older sister sells flowers and encouraged me to do it also.