

**Excerpt from Chapter 4: Supporting Smallholders
Developing Smallholder Agriculture: A Global Perspective**

Marketing of Tomatoes in Nepal

An example of how family enterprise (private sector) supports smallholders, is the marketing of tomatoes from the Sharlahi District of the Terai in Nepal to the capital Katmandu (Manandhar, 1996). In Sharlahi, tomatoes are grown from September to April as a winter crop in rotation with summer crops of rice and maize. Tomatoes are normally handled by the private sector, even in countries with extensive state involvement in agriculture. They are a popular vegetable with a high demand among the general public.

In the middle of the season, the price the farmer in Sharlahi receives in the “haat bazaar”, a local bi-weekly farmers’ market where buyers can purchase produce from farmers for shipment to distant locations, is only one third what the consumer pays in Katmandu. This situation is fairly common and looks like an excessive profit margin for the middlemen. However, detailed analysis of marketing systems indicates only modest profits.

The biggest problem is a highly fragmented marketing system with a multitude of competing family enterprises, each with a rather small market volume so that the dealers have to compensate with higher mark-ups than in more developed economies where large companies handle larger volumes, with smaller overheads.

The marketing system in Nepal is actually fairly efficient, capable of delivering tomatoes from the farmers’ fields to the consumer in 48 to 60 hours. However, there are numerous steps in the marketing process, each with its handling costs and opportunity for spoilage losses. As in most Developing Countries’ marketing operations, the entire wholesale process is done by volume or sight without any weight checks. Weights only became involved for the final sale to retailer, or from retailers to customer.

The Marketing Process of Tomatoes in Nepal: The general marketing process is:

1. Tomatoes are picked during the afternoon and transported from field to the homestead.



Photo 4.5 Tomatoes being displayed at haat bazaar in Nepal for auction by buyers. Photo Credit: S. Manandhar.

2. In the evening the tomatoes are sorted and packed into small tokaries, a round bamboo basket holding 20 - 30 kg each, or dokoes, a bamboo backpack type basket holding 50-60 kg.

3. Early the following morning, the tomatoes are transported from the homestead to the haat bazaar, a distance of up to 10 km. The haat bazaar is an open, muddy field with no facilities. Transportation is mostly by bullock cart holding 40 small tokaries for a total of approximately 1,000 kg, but representing the marketed produce of 1-5 individual smallholders who must accompany the bullock cart, walking beside it. The alternative is using backpack dokoos.
4. Upon arrival in the bazaar, the tokaries and dokoos are placed on the ground for inspection by potential wholesale buyers (Photo 4.5).
5. The buyers and growers haggle over the price until agreement is reached, normally for the full amount displayed by an individual grower. No weighing is done. The price depends on the number of wholesalers in the market and estimated demand based on phone calls from the one available public phone to the wholesaler's partner in the wholesale market in Katmandu, a one-sided communication system in favor of the buyers. However, it still translates into a fairly equitable system, as buying remains highly competitive among the traders ensuring the farmers a fair share as will be discussed below.
6. Once purchased, the tomatoes are dumped on ground clothes and the original containers are returned to the producer.



*Photo 4.6 Repacking tomatoes in the haat bazaar of Nepal for shipment.
Photo Credit: S. Manandhar.*

7. The buyers then consolidate their purchases, co-mingling the tomatoes of different producers. Because the cool temperatures in Katmandu retard ripening, those destined for Katmandu have to be riper, and are thus more susceptible to compression spoilage, than those going to warmer destinations where they would naturally ripen. For this reason they would be repacked into rigid, stackable, plastic crates holding approximate 28 kg. Those going elsewhere are repacked into larger tokaries with extended sides that hold 80 kg or more (Photo 4.6).
8. All sales in the haat bazaar are completed by noon, less than 24 hours after picking, and by mid-afternoon all tomatoes are ready for shipment. Tomatoes going to small towns are then loaded on the tops of buses for transport, or specially partitioned trucks. Those going to Katmandu are loaded into 6-ton trucks holding 228 plastic crates.
9. As few wholesalers handle sufficient tomatoes for the entire truck, the loads are combined so that a truck can hold the produce of as many as 10 individual wholesalers, each handling 15-30 plastic crates, and representing the co-mingled produce of 20 or more

individual smallholders.

10. The various transport vehicles leave the haat bazaar 24 hours after picking, for the 14-hour trip to Katmandu or elsewhere. The trip is made primarily during the cool of the night, which reduces heat build-up in the confined unrefrigerated trucks and respiration losses associated with heat build-up. The arrival at the Katmandu wholesale market is early the following morning.
11. Upon arrival at the Katmandu wholesale market, approximately 36 hours after picking, the crates are disaggregated to the respective partners of the buyers in the Sarlahi. In most cases, the partnership is among relatives. Thus, each wholesale operation supports two families, the collector's family in Sharlahi and the distributor's family in Katmandu. The Katmandu wholesalers are mostly specialized in the few crops they handle and the source from which they obtain them. Occasionally, they will obtain produce brought to the market on consignment from a driver representing a wholesaler without a destination partner.
12. Like the haat bazaar in Sharlahi, the wholesale market in Katmandu is also an unpaved, muddy, open area on the outskirts of the city with no permanent facilities other than the market headquarters where wholesalers and truckers have to pay their usage fees.
13. Retailers come to the wholesale market to purchase and transfer tomatoes and other vegetables to their respective stalls distributed throughout the city. These retailers' purchases are frequently 5-10 kg of tomatoes and are consolidated with other vegetables. At this point, weighing is introduced into the system as an option.
14. Transferring the vegetables to retail stalls depends on the distance, and the volume involved. It can be on the back using large dokoos, by bicycle, motor tricycle, or pickup, depending on the volume involved.
15. Consumer sales commence as soon as the retailers return and open their stalls later in the morning and less than 48 hours after picking.
16. After a days rest, the transporter returns to Sharlahi with the empty crates from the previous trip. On the return trip the transporters serve as courier for cash and any messages back to the buyers. Typically, drivers carry some US \$ 4,000 on their return trips, which represents a minor security risk from bandits. However, this is minimized by the daytime travel. The Nepal banking system, at the time (1996), did not allow for alternatives.

Analysis of the Nepal Marketing System: Throughout the marketing process in Nepal there are costs associated with handling the crop in each step, as well as opportunities for additional spoilage losses. Actually, the losses are very reasonable. For the tomatoes going to Katmandu the total losses were only 21%. This was broken down to 7% spoilage losses in the haat bazaar, 7% in the Katmandu wholesale market, and 7% in the retail outlet. Even though no weights were taken in the first two operations, these losses were well-known and accurately estimated by all concerned. In addition to the spoilage losses there was a 4.5% respiration loss associated with picked tomatoes still being live organisms that continue their biological metabolism even after picking. As there are no weight checks being made, and the water loss did not noticeably reduce the turgidity of the tomatoes, these losses are largely unnoticed. The total losses were considerably less than the 50% traditionally associated with handling vegetables in developing countries (APO, 1989). Much of the reduction in spoilage losses can be associated with the shift from bamboo baskets to rigid and stackable plastic crates, at least for shipments to Katmandu.

The result of these losses is that, in order to market 100 kg of tomatoes to the consumer, the wholesaler must purchase 126 kg from the farmer, which essentially, and somewhat discreetly, increases the percentage of the consumer price the farmer actually receives.

Table 4.3. Marketing Cost Analysis for Delivering 100 Kilograms of Tomatoes to the Consumer in Kathmandu

Item	Weight Needed (kg)	Unit Cost (US\$) ^a	No. Units ^b	Cost/ 100 kg Delivered (US\$)
Purchase Price	126	12.54/ 100 kg	1.26	15.06
7% weight adjustment for damages at haat bazaar	117			
Shipping container (crate)	117	0.035/crate	4.18	0.146
Packing Material	117	0.016/crate	4.18	0.068
Packing labor	117	0.032/crate	4.18	0.135
Loading charge	117	0.032/crate	4.18	0.135
Marketing Tax	117	0.0485/crate	4.18	0.203
Transportation Cost	117	0.436/crate	4.18	1.823
Unloading in Katmandu	117	0.0485/crate	4.18	0.203
Market tax in Katmandu	117	0.0485/crate	4.18	0.203
Misc. charges for road taxes, overload fines, etc.	117	0.032/crate	4.18	0.135
Weight adjustment for respiration (4.8%) and damages (6%)	105			
Porter fees to retail stall	105	0.009/kg	105	0.945
Weight adjustment for losses at stall	100			
Total cost				18.86

^a Based on Dec/Jan average prices. All dollar values were converted from Nepal Rupees at US\$ = 55.0 Rupees

^b Assumes a plastic crate will hold 28 kg.

The actual cost incurred in marketing tomatoes from wholesale buyer to consumer amounts to \$4 per 100 kg (Table 4.3). This can all be broken down into various charges including market and road taxes.

The biggest charge is for transportation amounting to almost 50% of the total non-farm cost. Individually the rest are very minor, but add up to a considerable cost.

In Sarlahi, the marketing costs remain fairly uniform throughout the season, while the prices fluctuate with supply and demand based on what is available in the market, what is being provided from other sources, and what is available from the farmers.

Typically, prices will be high in the beginning of the season, will go down as the production peaks, and goes up as production tails off toward the end of the season, or, as in the case of Sarlahi, farmers have to shift to their main summer crops of rice or maize.

The seasonal price fluctuations reflects the percentage of the final consumer price received by the different people involved (Table 4.4).

With all the losses factored in, the farmers actually receive anywhere from 31-63 % of the consumer price, depending on when during the season the transaction occurred. This has to cover their cash cost estimated at US \$4.13 per 100 kg with their profit margin representing returns to family labor.

This averages well above the 1/3 consumer price nominally claimed as their returns based on the apparent mid-season difference between haat bazaar and consumer prices. *The producer thus enjoys the highest profit margin.* Actually, most of the seasonal price fluctuation was accounted for in the fluctuations in the returns to the farmer.

The wholesalers, those normally considered exploitative of the smallholder, actually had the lowest profit margin in the study. Essentially they charge a near fixed price for the services they provide and are apparently not taking too much advantage of the seasonal price fluctuations.

The actual profit margin was only US \$1.45 per crate to be divided between two families; the collecting wholesaler in Sarlahi, and the distributing wholesaler in Katmandu.

When the US \$1.45 per crate was multiplied by the typical number of crates being handled, an estimate of the wholesalers' income was obtained (Table 4.5).

This income was consistent with that of a mid-level civil servant. It provides the wholesaler with a comfortable but not exorbitant living, with considerably more risk than the corresponding civil servant.

Table 4.4. Profit Margins for Marketing 100 kg of Tomatoes to Katmandu Consumers ^a

For the Producer							
Months	Prod. Cost / 100 kg	Selling Price / 100 kg	kg Needed	Total Received	% of Consumer price	Profit Margin	% of consumer Price
Oct./Nov.	4.13	32.58	126	41.05	63.54	35.85	55.50
Nov./Dec	4.13	19.00	126	23,94	45.22	18.74	35.40
Dec./Jan.	4.13	9.95	126	12.54	31.90	7.34	18.67
Jan./Feb.	4.13	10.41	126	13.12	43.81	7.92	26.77
Feb./Mar.	4.13	11.76	126	14.82	47.03	9.62	30.53
For the Wholesaler							
Months	Purchase Price	Expenses incurred	Kg. Sold	Selling Price /100 kg	Total received	Profit Margin	% of Consumer price
Oct./Nov.	41.05	4.00	105	52.33	54.93	9.90	15.33
Nov./Dec	23,94	4.00	105	35.13	36.89	8.96	16.91
Dec./Jan.	12.54	4.00	105	21.56	22.64	6.10	15.52
Jan./Feb.	13.12	4.00	105	23.86	25.05	7.93	26.80
Feb./Mar.	19.62	4.00	105	27.24	28.60	9.78	31.04

Table 4.4. Profit Margins for Marketing 100 kg of Tomatoes to Katmandu Consumers (cont.)

For the Retailer					
Months	Purchase Price	Expenses	Selling price^b	Profit Margin	% of Consumer Price
Oct./Nov.	54.95	0.94	64.60	8.71	13.48
Nov./Dec	36.89	0.94	52.94	15.11	28.54
Dec./Jan.	22.64	0.94	39.31	15.73	40.02
Jan./Feb.	25.05	0.94	29.59	3.60	12.17
Feb./Mar.	28.60	0.94	31.51	1.97	6.25

^a All monetary values are in US dollars converted from Nepalese Rupees at US\$ = 55.0 Rupees

^b This value is the basis for computing all % of consumer prices.

Shaded lines represent the values used in table 3 and 5.

No. Handled	Income Per Unit	Daily Income	Monthly Income (8 trips)	Monthly Income per Family
Plastic Crates				
20	1.45	29.00	232.00	116.00
30	1.45	43.50	348.00	174.00
40	1.45	58.00	464.00	232.00
50	1.45	72.50	580.00	290.00
Tokari				
7	7.84	54.88	439.04	219.52
10	7.84	78.40	627.20	313.60
14	7.84	109.76	878.08	439.04
17	7.84	133.28	1066.24	533.12

Comparison with Colorado, USA

In contrast to the above-described marketing procedure, Colorado Greenhouses Inc., which grows pesticide free, hydroponic tomatoes using surplus heat from various power generators in the State, packs tomatoes directly from the greenhouses' packing shed into disposable cartons partitioned for individual tomatoes. The tomatoes are then dispatched via refrigerated 40-foot trailer trucks directly to wholesale distributors in distant cities and to retail supermarkets; all in one operation. Colorado Greenhouses can get tomatoes from the greenhouse to the retail counter in 24 hours, with at most one repackaging to consumer packs. They claim less than 1% spoilage loss and 3% respiration loss, with a total price mark-up from 50-100%. However, the consumer cost will be US \$2.50/kg, or five times the consumer price in Nepal. The price difference reflecting the relative cost of production and living standards of developed and developing countries.