

Fruit and Vegetable Marketing and its Efficiency in India: A Study of Wholesale Markets in the Ahmedabad Area

Vasant P. Gandhi and N.V. Namboodiri

**Indian Institute of Management, Ahmedabad, India
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Abstract

There has been concern in the recent years regarding the efficiency of marketing of fruits and vegetables in India. It is believed that poor efficiency in the marketing channels and poor marketing infrastructure is leading not only to high and fluctuating consumer prices, but also to only a small proportion of the consumer rupee reaching the farmers. The paper examines regulated wholesale markets for fruits and vegetables in the Ahmedabad city area, a large city of 4.5 million in western India. The markets were established to facilitate and improve the marketing efficiency. The paper studies their infrastructure, operation and status, and the value chain - from farmer to wholesaler to retailer to consumer. A variety of facilities and services are provided at the three regulated wholesale markets studied. The ratings by farmers, commission agents and retailers indicates that location is the most important, followed by go-down facility, yard maintenance, weighing, price display, and banking facilities. Analysis of the data on the system of sale followed indicates that use of open auction as a system of market transaction is very limited and most of the exchanges take place through secret bidding or simple transactions. Significant marketing efficiency losses may be taking place due to this. Analysis of marketing costs indicates that on an average they hover around 8 per cent of the consumer price for vegetables and around 11 to 15 per cent for fruits. Among different cost components, transport cost and commission are the most important. Analysis of prices at different levels indicates that overall the average share of the farmers in the consumer price is only around 48 per cent for vegetables and 37 per cent for fruits. A study of the profit margin after accounting for explicit marketing costs shows that the margin is frequently as high as 80 to 90 percent as a percentage of the farmer-consumer price difference. This may indicate significant imperfections and poor marketing efficiency. The study indicates that the regulated wholesale markets can help in improving the efficiency by measures such as increasing the direct contact with the farmers, increasing the number of buyers and sellers in the market, promoting the use of open auction at the market, and improving/ adding facilities and services such as go-down, cold storage, weighing, and transparency and access to internal and external market information.

¹ Professor and Research Associate, respectively, Indian Institute of Management, Ahmedabad 380015, India. email: gandhi@iimahd.ernet.in The authors wish to thank Suresh Sharma and C.J. Varughese for their assistance.

Fruit and Vegetable Marketing and its Efficiency in India: A Study of Wholesale Markets in the Ahmedabad Area

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Introduction:

There has been great concern in the recent years regarding the efficiency of marketing of fruits and vegetables in India. It is believed that poor linkages in the marketing channels and poor marketing infrastructure are leading to high and fluctuating consumer prices, and to only a small proportion of the consumer rupee reaching the farmers (Kaul 1997, Ashturker and Deole 1985). There is also substantial wastage, deterioration in quality, and frequent mis-match between demand and supply spatially and over time (Subbanarasiah 1991, Singh et.al. 1985).

With growing demand and the accompanying supply response, fruits and vegetables have assumed great importance, and India now ranks second in the world in the production of vegetables and third in production of fruits (Boer and Pandey 1997). The value of output from fruits and vegetables during 1997-98 was over Rs. 780 billion, which is 25 per cent of the gross value of output from agriculture. Area under major fruits was about 2.25 million hectares and the annual production was 33 million tonnes during 1993-94. For vegetables, area was over 4.8 million hectares and the production 65 million tonnes. Horticultural crops are mostly labour intensive in India and provide substantial employment - not only in production but also transportation, processing and marketing (Sharma 1991). The marketing of horticultural crops is also quite complex and risky due to their perishable nature, seasonal production and bulkiness.

In light of these issues, the paper examines selected aspects of fruit and vegetable marketing in Ahmedabad, a large city in western India, with a population of about 4.5 million.

The paper focuses particularly on the regulated wholesale markets for fruits and vegetables, which have been established to overcome problems and improve the marketing efficiency. The paper examines aspects of the markets including their infrastructure, functioning, marketing practices, as well as the value chain from the farmer to wholesaler to retailer to consumer.

Background and Data

Before the establishment of regulated markets, wholesale trade in fruits and vegetables in and around Ahmedabad was largely controlled by a few traders. Unfair and exploitative practices were common. There were no commission agents to facilitate the market transactions. Since the establishment of regulated markets, licensed commission agents, representatives of farmers, traders, co-operatives and the government have gradually begun to oversee fruit and vegetable trade in the regulated markets. This is through the Agricultural Produce Marketing Committee of Ahmedabad (APMC) which controls and administers the regulated markets. Members of this committee consist of farmers, traders, cooperative marketing societies, cooperative and commercial banks, and officials of local bodies and government. The APMC controls an infrastructure of three wholesale market yards in Ahmedabad for fruits and vegetables. These wholesale markets are:

1. The Sardar Patel Market Yard (SP Market), Outside Jamalpur Gate, Paldi, Ahmedabad
2. The Chimanbhai Jivabhai Patel Market Yard (CJP Market) at Vasna Octroi Naka, Ahmedabad
3. The Naroda Fruit market, Naroda, Ahmedabad.

The CJ Patel market deals with potato and onion only. The Sardar Patel market deals with other vegetables such as tomato, cabbage, cauliflower, brinjal (egg plant), green pea and lady's finger (okra). The Naroda Fruit Market deals with fruits.

Though the APMC was started in 1948, the market yards were established much later. The year of establishment, plot size and the number of licensed traders operating in the three market yards are given in Table 1.

Table 1: Year of Establishment, Size of Market Yard and Licensed Traders

Market	Year of Establishment	Plot size (Sq. Yds)	Number of licensed traders			Office Staff
			Commission Agent	Co-op. Soc.	Others	
Sardar Patel Market	1980	16000	159	3		33
C J Patel Market	1996	50000	115	2	3	10
Naroda Fruits Market	1998	22577	120			9

In the first part of the study, information was collected from the offices of each of these market yards regarding their infrastructure and operation. Following this, a sample survey was conducted of the participating commission agents/wholesalers, retailers and farmers through structured questionnaires. A larger sample was not possible given the time constraint. The sample size is described in Table 2. The number of commission agents interviewed account for 19 percent, 26 percent and 13.3 percent of the total commission agents operating in these markets – CJP, SP and Naroda respectively.

Table 2: Details of the Sample

Selected Regulated Markets	Commission Agents	Retailers	Farmers
CJ Patel Market	30	28	26
Sardar Patel Market	30	30	21
Naroda Fruits Market	16	18	12
Total	76	76	59

Based on the volume, importance and diversity considerations, the following vegetables were selected for the sample survey: potato, onion, tomato, cabbage, cauliflower, brinjal,

green-pea and lady's finger (okra), and the fruits selected were mango, apple, sapota, banana, sweet orange, pineapple and pomegranate.

Profile of the Infrastructure, Services and Finances of the Markets

Table 3 provides an overview of the different infrastructure facilities available as well as functions and services undertaken at the market yards. Whereas facilities such as stalls, roads and street lights are available in all of them, others such as telex/fax, conference hall and rest house are not available in all, and facilities such as cold storage and weigh-bridge are not available in any. The prevailing charges in the markets are shown in Table 4. The commission, currently at 6 per cent of the value of produce, and the market fee at 0.5 per cent are collected from the purchaser. However, if the seller is from outside the state, the market fee is to be paid by the seller. The commission goes to the commission agent and the market fee to the APMC.

Table 3: Market Infrastructure Facilities, Services and functions at the different market yards.

Infrastructure/Facilities	Availability			Services	Availability		
	CJP Market	SP Market	Naroda Market		CJP Market	SP Market	Naroda Market
1 Market Office	✓	✓	✓	1. Issues Licenses	✓	✓	✓
2 Stalls/Godown	✓	✓	✓	2. Collecting Marketing Fee	✓	✓	✓
3 Cold Storage				3. Collection of Taxes	✓	✓	✓
4 Vehicle Parking	✓	✓	✓	4. Issuing Gate Pass	✓	✓	✓
5 Shed for Animals				5. Supervision of Sale	✓	✓	
6 Road	✓	✓	✓	6. Auctioning	✓	✓	
7 Streetlight	✓	✓	✓	7. Loading	✓	✓	✓
8 Water Supply	✓	✓	✓	8. Unloading	✓	✓	✓
9 Sanitary	✓	✓	✓	9. Weighing	✓	✓	✓
10 Bathroom	✓	✓	✓	10. Sorting			
11 Canteen	✓	✓	✓	11. Grading			
12 Rest House for Workers	✓			12. Packing			
13 Rest House for Farmers	✓	✓	✓	13. Labeling			
14 Conference Hall	✓	✓		14. Branding			
15 Watchman	✓	✓	✓	15. Transport Arrangements			
16 First Aid	✓	✓		16. Quick Disposal		✓	
17 Fire Fighting				17. Recording of	✓	✓	✓

Facility				Arrivals			
18 Telephone	✓	✓	✓	18. Recording of Disposal	✓	✓	✓
19 Telex/Fax		✓		19. Immediate Payment	✓	✓	✓
20 Bank	✓	✓	✓	20 Price Display			
				a) Notice Board;	✓	✓	
				b) News Paper	✓	✓	
				c) Internet	✓	✓	
				d) Telephone;	✓	✓	
				e) Email	✓	✓	
21 Waste Disposal Facility	✓	✓	✓	21. Other Market's Price Information	✓	✓	
22 Weigh Bridge				22. Computer	✓	✓	✓
23 Tower Clock	✓	✓		- Internet	✓	✓	
24 Notice Board	✓	✓	✓	- Website	✓	✓	
25 Garden	✓			- Email	✓	✓	
26 Fountain	✓			23 Others (specify)			
27 Kiosk System	✓	✓					
28 Water Cooler	✓	✓	✓				
29 VIP Guest House	✓						
30 Internet facility	✓	✓					

Table 4: Rate of Commission/Market Charges at the APMC

Item	Unit/Per	Rate (Rs.)	Recoverable from
Commission Charge	Rs. 100	6.00	Purchaser
Market Fee	Rs. 100	0.50	Purchaser
Weighman Charges (Unloading & Tolai)			
Green & Leafy Vegetable	Upto 30 Kg.	1.00	Purchaser
	31 Kg to 60 Kg	2.00	Purchaser
	61 kg & above	2.50	Purchaser
Tomatoes / Fruits	One box	1.00	Purchaser
Potatoes / Onions	Small bag	1.75	Purchaser
	Big bag	2.50	Purchaser
Carting Charges			
From B.G. Station to Market Yard	Big bag	1.00	Purchaser
	Small bag	0.80	Purchaser
From M.G. Station to Market Yard	Big bag	1.20	Purchaser
	Small bag	1.00	Purchaser
Marfat			
Goods Train	One bag	0.05	Purchaser
Passenger Train	One bag	0.10	Purchaser
Recording Charges			
To record weights spoken by tolai	One bag	0.01	Purchaser

The overall sources and uses of funds of APMC work out as follows: The total annual earnings from the three markets to APMC amounted to Rs. 27.2 million during 1999-2000. The largest contribution was from the SP Market (46 percent) followed by the CJP Market (38 percent) and then the Naroda Fruit Market (16 percent). Among the various sources of income, the market fee dominates at 74 percent in CJP Market, 93 percent in SP Market and 97 percent in Naroda Fruit Market. Income from stall fee was significant in the CJP Market (20 percent).

The breakup of the uses of funds by the APMC in the three markets is as follows: The highest expenditure was reported by the CJP Market, followed by the SP Market, and then the Naroda Fruit Market. The expenditure pattern in the CJP Market showed that the largest share in total expenditure is on electricity (50.3 per cent), followed by 27.7 per cent on salary. In the case of the SP Market, salary constitutes 47.4 per cent, followed by 35.1 per cent for electricity. In the case of Naroda Fruits Market, 56.6 per cent goes towards salary, followed by 15.4 per cent for rent. Thus, electricity and salary constitute the major expenses of the APMC. The total expenditure of the APMC in the three markets amounts to Rs. 3.62 million. With a total earning of Rs. 27.2 million, the sources and uses of funds by the APMC indicates that there is a very substantial excess of income over expenditure: the financial viability of the APMC is excellent.

Market Arrival of Fruits and Vegetables

Data shows that over the years there has been a substantial increase in the quantity of market arrivals. From about 52 thousand tons in 1949/50 the arrivals reached nearly 700 thousand tons by 1998/99. The average nominal prices increased from Rs. 25 per quintal to Rs. 552 per quintal over this period. The growth in market arrival was modest in the 1960s and 1970s, but very rapid during 1980s and 1990s.

Table 5 shows the composition of arrivals of different vegetables in the regulated market yards during 1999-2000. Of the 35 commodities recorded, potato holds the top position, and is followed by onion and tomato. Their market arrivals during 1999-2000 were respectively 207, 124 and 65 thousand tons. Among other major vegetables are cabbage, cauliflower, green-chillies, brinjal, ginger, green-pea and lady's finger.

Table 6 gives the composition of arrival of fruits in the Naroda regulated market yard where data on 24 different fruits are recorded. The top most positions are occupied by mango (55.5 thousand tons) and apple (45.1 thousand tons) followed by green-coconut, sweet orange, pineapple, sapota and pomegranate. It may be mentioned that banana is also one of the major fruits consumed in the Ahmedabad city area, but currently only a small quantity is traded through the regulated market yard and hence it ranks 13th among the 24 fruits.

Table 5: Arrival of Vegetables in CJP and SP Market Yards (1999-2000) (Quintals)

Vegetables	Quantity	Rank
1. Potato	2,069,080	1
2. Onion	1,236,773	2
3. Tomato	648,675	3
4. Cabbage	307,023	4
5. Green Chillies	260,062	5
6. Cauliflower	200,823	6
7. Brinjal	170,620	7
8. Ginger	145,572	8
9. Green peas	132,089	9
10. Lady's fingers (Okra)	102,842	10
11. Little Gourd	91,944	11
12. Cluster Beans	78,300	12
13. Cucumber	73,605	13
14. Bottle Gourd	70,488	14
15. Bitter Gourd	51,700	15
16. Cowpea	48,560	16
17. Indian Beans	43,034	17
18. Lime	37,537	18
19. Elephant Foot	37,248	19
20. Green Onion	30,820	20

21. Sweet Potato	30,045	21
22. Pigeon Pea Beans	25,324	22
23. Smooth Gourd	16,715	23
24. Ridge Gourd	15,692	24
25. Pointed Gourd	10,788	25
26. Drum Stick	10,618	26
27. Garlic (Green)	8,348	27
28. Tinda (<i>Citrullus vulgaris fistulosus</i>)	6,921	28
29. French Beans	6,589	29
30. Yam	5,402	30
31. Pumpkin	5,158	31
32. Garlic (Dry)	3,795	32
33. Flat Beans	3,313	33
34. <i>Mogari</i>	3,285	34
35. Green tomato	1,272	35

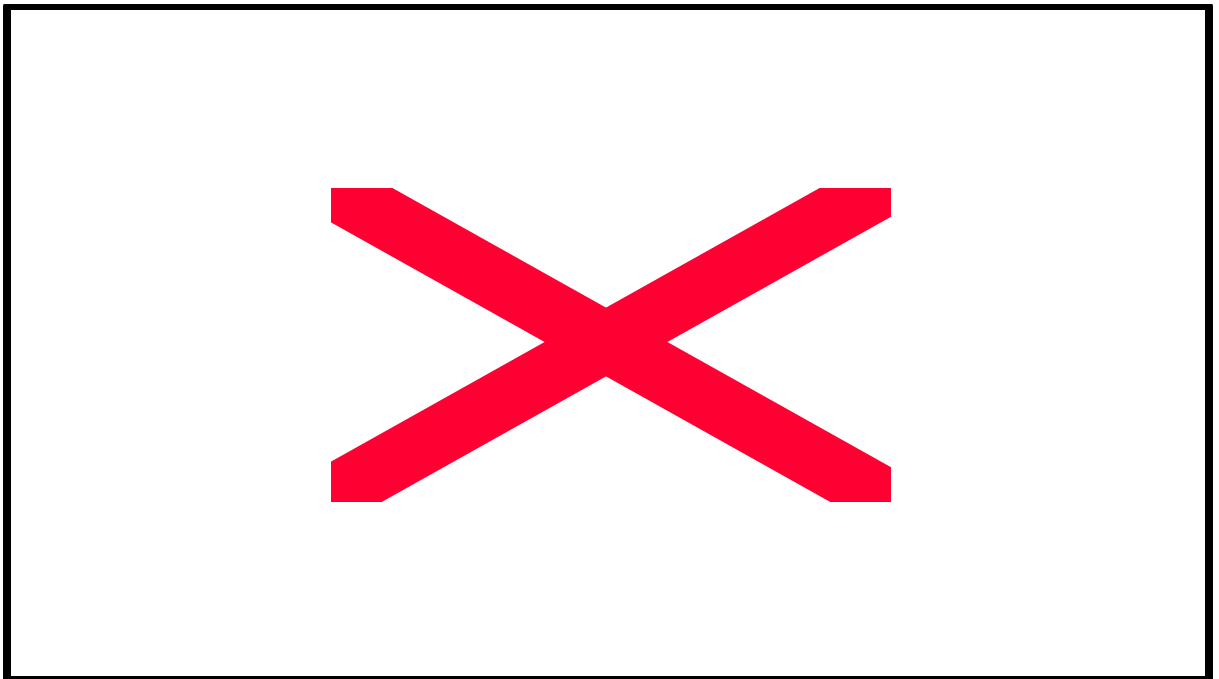
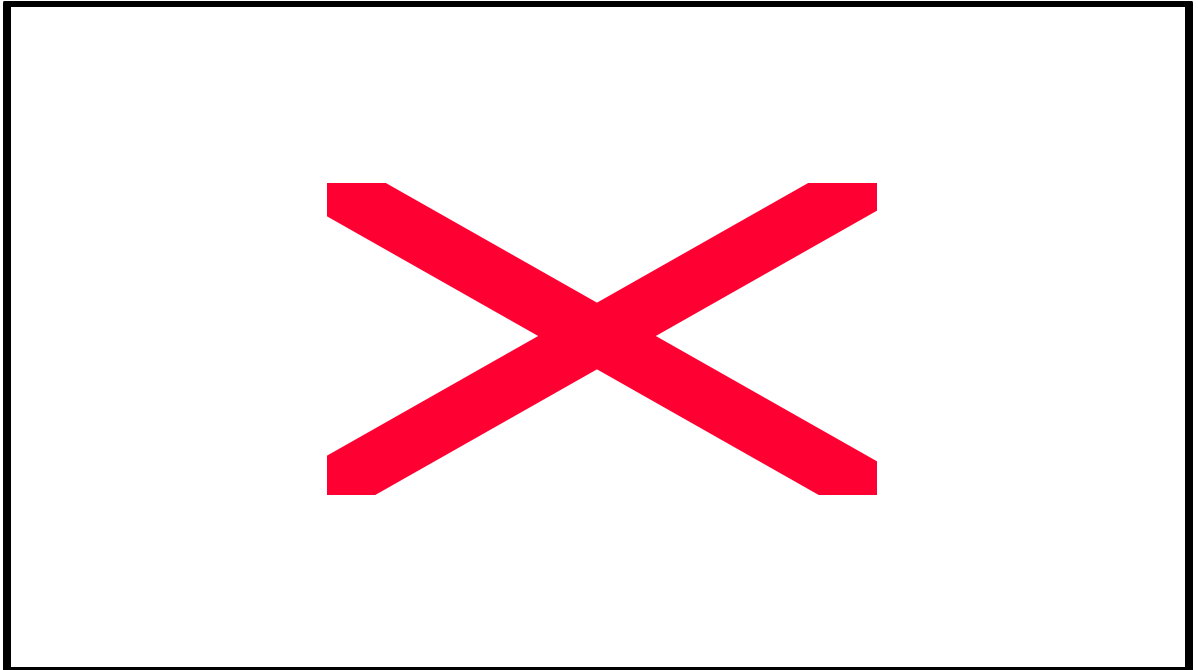
Table 6: Arrival of Fruits in the Naroda Market Yard (1999-2000) (Quintals)

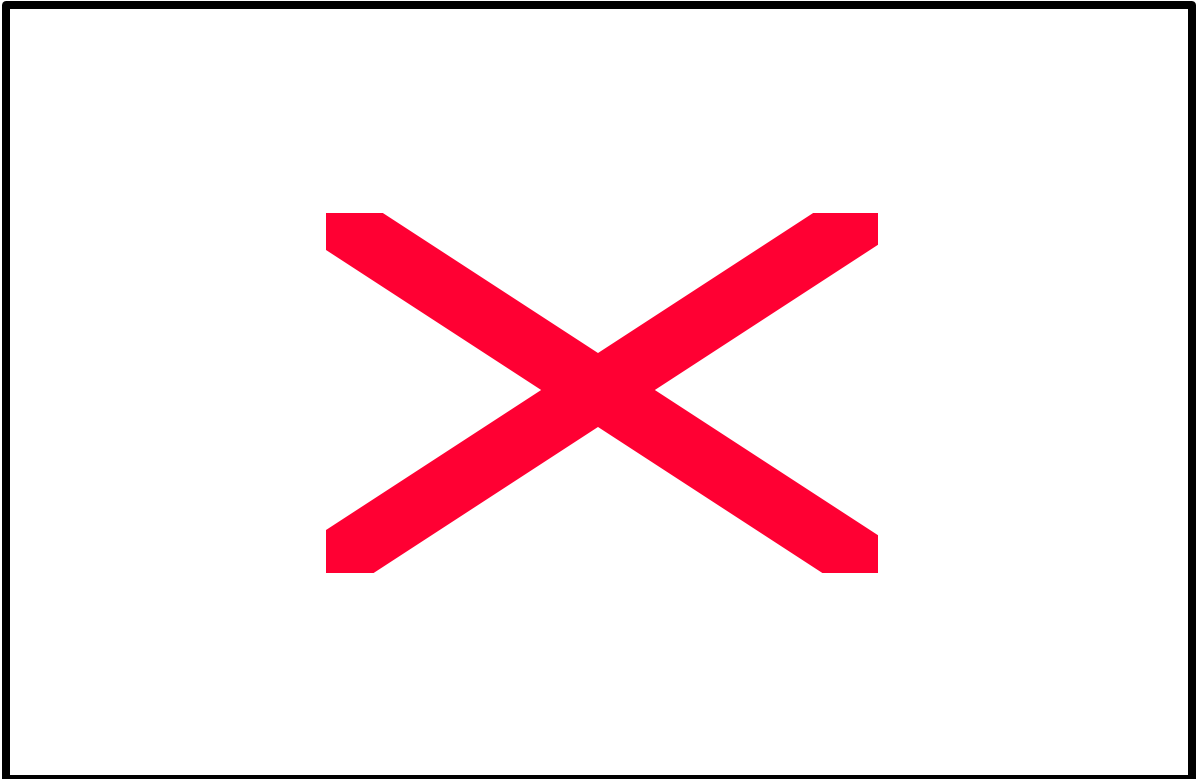
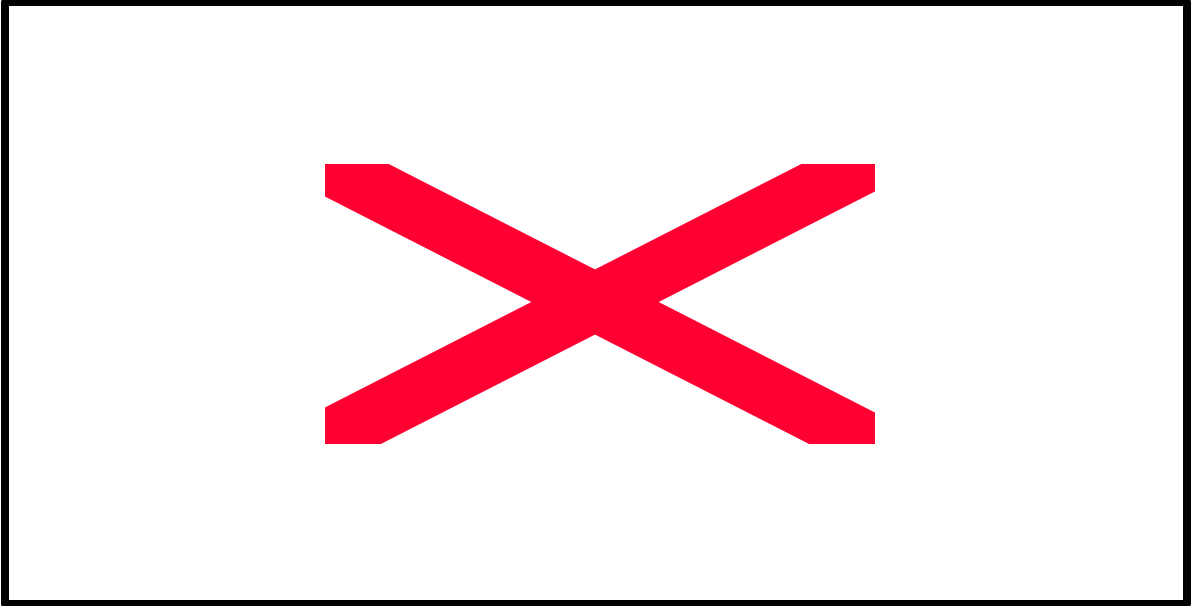
Fruits	Quantity	Rank
1. Mango	555,381	1
2. Apple	451,169	2
3. Green coconut	255,366	3
4. Sweet Orange (Malta)	175,729	4
5. Pineapple	151,231	5
6. Sapota	136,177	6
7. Pomegranate	132,742	7
8. Grape	64,600	8
9. Pear	49,178	9
10. Jujube	31,268	10
11. Papaya	22,641	11
12. Orange (Mandarin Orange)	17,682	12
13. Banana	11,872	13
14. Water Melon	9,345	14
15. Raspberry Plum	6,183	15
16. Plum	5,150	16
17. Custard apple	4,471	17
18. Guava	1,610	18
19. Pear-soft	1,363	19
20. Cherry	886	20
21. Mulberry	450	21
22. Strawberry	158	22
23. Fig	51	23
24. Musk Melon	22	24

Monthly Sales Pattern of Selected Fruits and Vegetables

Monthly arrival/sales patterns of selected vegetables are shown in Figures 1 and 2. The figure shows that the sales of potato, onion and tomato are relatively evenly spread throughout the year. On an average the months of December and March, show a slightly higher volume of potato transaction compared to other months: 10.6 per cent and 11.8 per cent respectively of the annual sales. For onion, sales during the months of March and April shows a higher percentage, 11.3 and 11.7 percent, whereas August shows the least sales at 4.7 percent. For tomato, while September, December and January are the peak months with a share of 11.5, 10.6 and 9.0 per cent respectively and July is the lean months with a sale of hardly 5.6 per cent. Similarly sale of cabbage and brinjal and lady's finger were evenly spread over throughout the year, but to a lesser extent compared to potato and onion. But the sale of cauliflower and green-pea were highly concentrated within three to four months. Thus, seasonality varies across vegetables. Potato, onion and tomato show low seasonality; whereas brinjal, cabbage and lady's finger show medium seasonality; and cauliflower and green-pea show high seasonality.

Figures 3 to 4 give the monthly sales pattern of selected fruits in the Naroda Fruit Market. Among the selected fruits, mango shows extreme seasonality with 46 per cent of the annual sale during the month of May and 25 percent during June. No sale is recorded from September to January. Similarly apple also show considerable seasonality, but lesser than mango. July to October are the peak months with a share of over 65 percent of the annual sales. The sale of sapota is evenly spread over all months except September, October and July.





Peak sale in the case of banana is observed during August, September, and October with 28.8, 19.2 and 11.5 per cent of sales respectively. Sweet orange shows several peaks. While January to March are peak months for pineapple, and for pomegranate these are August to November. On the whole, the seasonality in sale for fruits is varied and greater than that for vegetables.

Note that the overall seasonality in sales pattern and other features discussed above are based on the data from the APMC records. However, in the sample survey, it was not possible to cover the entire annual cycle, given the time limits for the survey. The sample survey results reported below are based on observations over about a 4 to 6 months period in the market during January to July 2001.

Marketing Practices, Marketing Costs and Price Spread: Survey Results

Existing Marketing Practices

Table 7 shows the sourcing pattern of buying and selling by various parties involved in the marketing. It reveals that for vegetables 50 per cent of the commission agents purchases are made directly from farmers, whereas about 33 per cent are from traders, and 17 per cent from cold storage points. Thus, contact with farmers is significant but not very large. For fruits, only 31 per cent of the purchases are made directly from farmers, 56 per cent from traders, and 13 per cent from commission agents. This pattern reveals that there is more direct contact between commission agents and farmers in the case of vegetables as compared to fruits. On the other side, mainly, the commission agent sells to the retailers, and the retailers sell directly to the consumers except for some retailer to retailer sale. Thus, it is the chain from the farmer to the commission agents/ regulated markets which appears to be weaker.

Table 7: From Whom Purchased or to Whom Sold

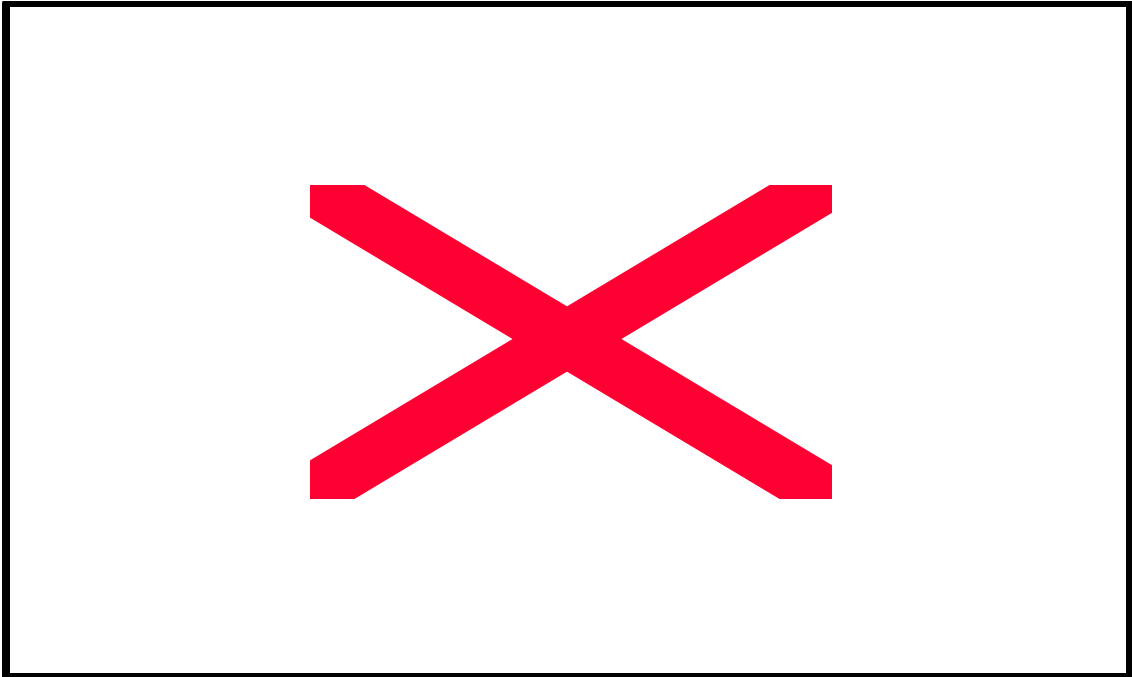
Particulars	Vegetables	Fruits	Fruits & Veg.	Vegetables	Fruits	Fruits & Veg.
	Number of Responses			Percentage Distribution		
From whom Commission Agent Purchased:						
Farmer	43	5	48	50.0	31.3	47.1
Trader	28	9	37	32.6	56.3	36.3
Commission Agent	0	2	2	0.0	12.5	2.0
Cold Storage	15	0	15	17.4	0.0	14.7
Total	86	16	102	100.0	100.0	100.0
From whom Retailer Purchased:						
Commission Agent	122	47	169	100.0	100.0	100.0
To whom Commission Agent Sold:						
Retailer-Trader	82	16	98	98.8	100.0	99.0
Commission Agent	1	0	1	1.2	0.0	1.0
Total	83	16	99	100.0	100.0	100.0
To whom Farmer Sold:						
Commission Agent	58	12	70	100.0	100.0	100.0
To Whom Retailer Sold:						
Retailer	8	0	8	6.7	0.0	4.8
Consumer	112	46	158	93.3	100.0	95.2
Total	120	46	166	100.0	100.0	100.0

One major factor determining the receiving of a fair price by producers is the system of sale followed in the markets. Table 8 and Figure 5 show the results of commission agent response regarding the transaction system. It indicates that in the CJP Market, about 55 per cent of the transactions take place through secret bidding, about 26 per cent through simple transactions, and only 19 per cent through open auction. In the SP Market, 63 per cent of the transactions take place through simple transactions, 30 per cent through secret bidding, and only 7 per cent through open auction. Only for tomato, open auction was prevalent to some

extent, at 11 per cent. In Naroda Fruit Market, 54 per cent of the transactions take place through simple transaction, 39 per cent through secret bidding, and 7 per cent through open auction. Thus, the share of the superior open auction system is very low in all the markets. The significant efficiency gains possible from the open auction system have not been realized in all these regulated markets. A very large percentage of the exchanges take place through simple transaction, not even through secret bidding. Thus, a lot of the potential efficiency gain at the market may be lost because of this.

Table 8: System of Sale Reported by Commission Agents in the selected Markets

Commodities	Number of Respondents			Percentage Distribution		
	Open Auction	Secret Bidding	Simple Transaction	Open Auction	Secret Bidding	Simple Transaction
CJP Market:						
Onion	6	14	7	22.2	51.9	25.9
Potato	5	17	8	16.7	56.7	26.7
Above Vegetables	11	31	15	19.3	54.4	26.3
SP Market:						
Tomato	1	3	5	11.1	33.3	55.6
Cabbage	1	6	10	5.9	35.3	58.8
Cauli flower	1	5	11	5.9	29.4	64.7
Brinjal	0	3	8	0.0	27.3	72.7
Green pea	1	3	7	9.1	27.3	63.6
Lady's Finger	1	3	7	9.1	27.3	63.6
Above Vegetables	5	23	48	6.6	30.3	63.2
Naroda Fruit Market:						
Mango	2	4	6	16.7	33.3	50.0
Banana	0	0	2	0.0	0.0	100.0
Sapota	0	4	4	0.0	50.0	50.0
Pomegranate	0	2	2	0.0	50.0	50.0
Above Fruits	2	10	14	7.7	38.5	53.8
All Fruits and Vegetables	18	64	77	11.3	40.3	48.4



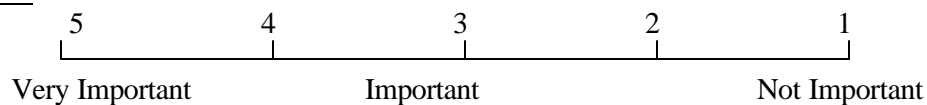
Infrastructure Features and their Perceived Importance

The average ratings of the facilities by the three kinds of respondents (farmers, commission agents and retailers) for the three markets are given in Table 9. The importance rating varies substantially across different respondents. However, in general, location, go-down facilities, maintenance and banking facilities are rated to be of relatively high importance, and this is followed by loading, weighing, price display and telephone facilities. Some of the more modern features, such as sorting, packing, computer and internet facilities are not rated to be of very high importance. This may be due to lack of experience and awareness about them among the sample respondents or their inadequate development in these markets. Location, go-down, loading, weighing and maintenance are currently indicated to be of high importance by the farmers.

Table 9 : Infrastructure and Facilities : Weighted Average Rating of Farmers, Commission Agents and Retailers

	C J Patel Market			Sardar Patel Market			Naroda Fruits Market		
	CA	Farmer	Retailer	CA	Farmer	Retailer	CA	Farmer	Retailer
1.Location	4.47	4.48	4.45	3.20	4.38	4.56	2.69	4.00	4.72
2.Godown facilities	4.63	4.05	4.23	1.55	2.05	1.76	2.88	3.00	2.83
3.Cold Storage	1.55	1.25	1.00	3.00	1.29	1.25			
4. Maintenance	4.28	2.00	3.25	3.62	2.30	1.50	1.38	3.14	2.00
5. Auction Charges	1.00	1.00		1.14			1.46	1.50	
6. Supervision of Sale	3.92	1.22	1.00	3.72		2.63	1.46	1.43	4.25
7. Loading Facilities	2.89	2.11	3.25	3.71	2.24	2.50	3.00	3.00	4.06
8. Sorting Facilities	1.67	1.00							
9. Weighing Facilities	2.11	3.36	3.00	3.00	3.00	2.39	3.00	3.00	3.06
10. Packing Facilities	1.00	2.00		1.00		1.50			1.00
Table 3.21 contd..									
11. Price Display	3.52	2.50	3.00	3.20		4.62			
12. Internal Telephone	4.13	2.33	4.50	3.37					
13. Computer Facility	1.67	1.00		1.78					
14. Internet Facility	2.36	1.00		1.57					
15. Banking Facilities	4.48	3.53	3.67	3.14	2.43	3.40	3.00	3.00	3.11
16.Market Holiday	3.69	1.80	2.14	2.85	2.52	1.92	3.00	2.00	1.53

Rating Scale:

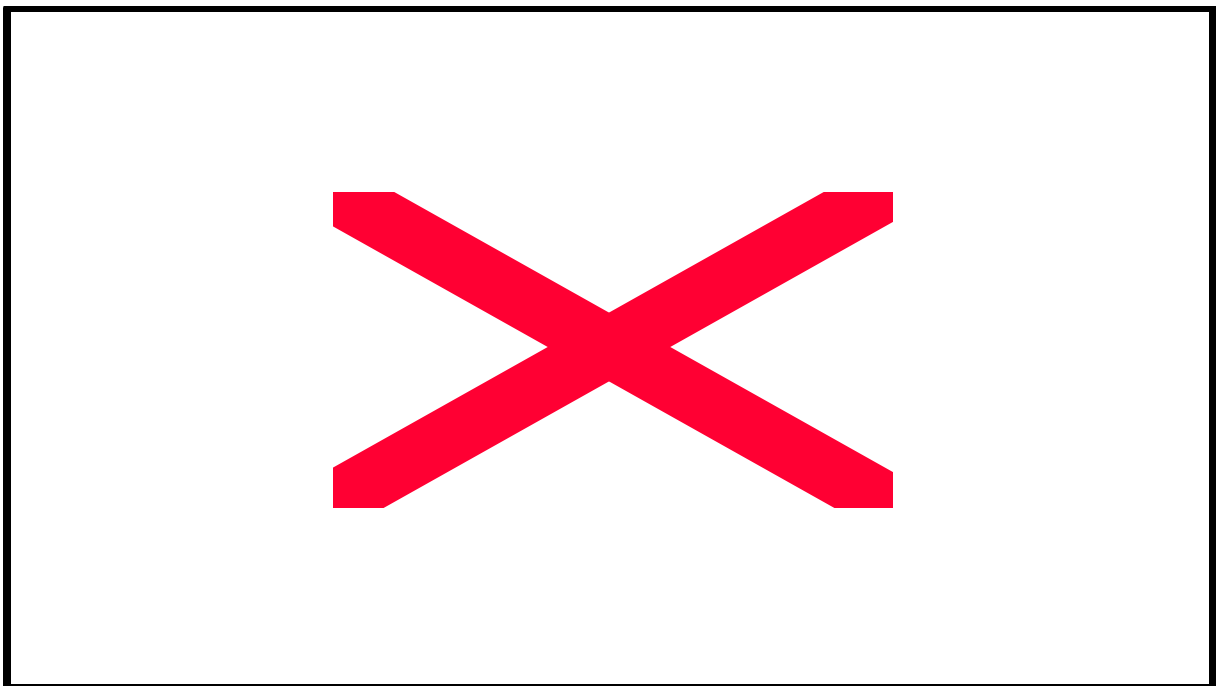


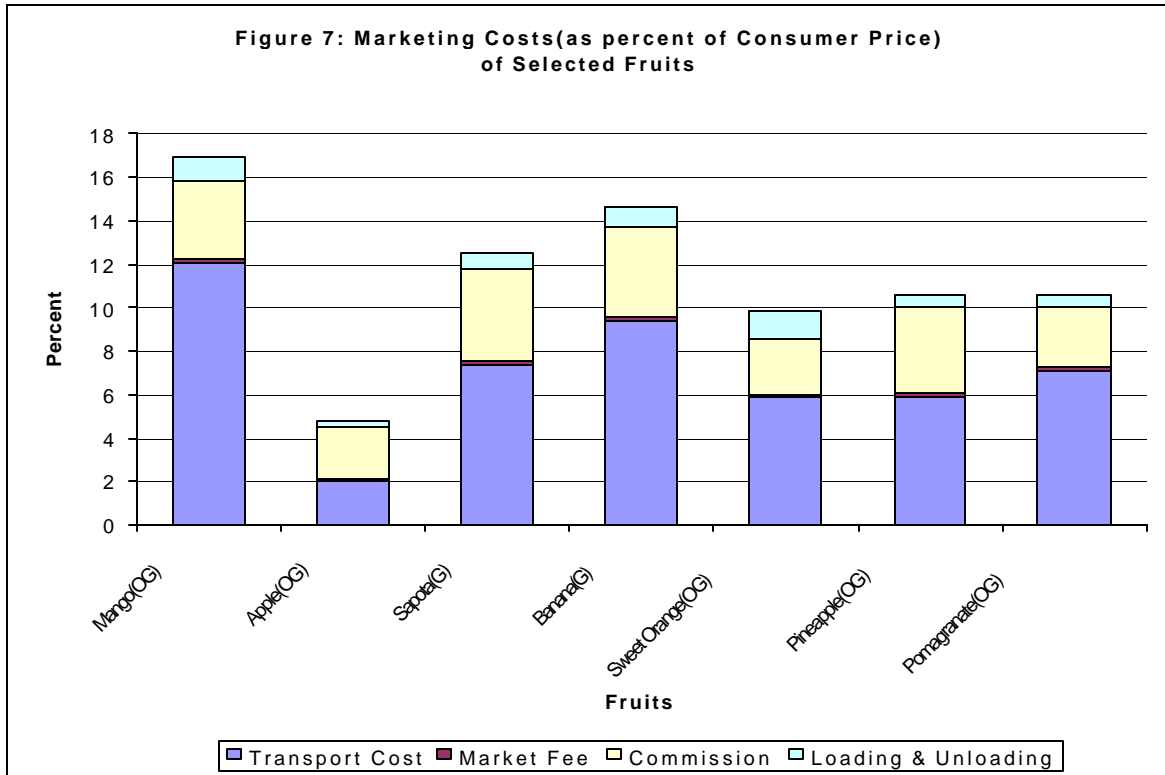
Cost of Marketing

Various costs are involved in the marketing of vegetables and fruits and information on these was collected from the respondents. The reported costs included transport cost, loading/unloading, market fee and commission. There is substantial variation in total marketing cost across commodities, ranging from Rs.360 per quintal for apple to Rs.74 per quintal for

potato, on a spot basis. Based on average during the week of the survey, some of the highest marketing costs are seen in the case of apple at Rs.400 per quintal, in which Rs.233 is contributed by commission and Rs.100 by transport costs. At the other extreme there is potato at Rs.71 per quintal, in which transportation contributes Rs.20 and commission Rs.28. In general the marketing costs of fruits are considerably higher.

The composition of various marketing costs as percent of consumer prices is shown in Figures 6 and 7. They indicate that the total cost varies from about 5 per cent for apple to about 19 per cent for onion and mango. On an average, the marketing cost hovers around 8 per cent of the consumer price for vegetables and around 11 to 15 per cent for fruits. Among different cost components, commission and transport costs dominate. For example for onion, the transport cost amounts to 10 per cent of the consumer price, and the commission 3-4 per cent. However, in case of green peas, while transport cost amounts to only 2 per cent of the consumer price, commission amounts to about 5 per cent of the consumer price.





Analysis of the Prices Spread and Farmer Share

Table 10 and Figure 8 present an analysis of the prices observed for different vegetables at the farmer, retailer and consumer levels. It indicates a substantial variation in the prices across these levels for all the vegetables that are studied. For instance in the case of onion, based on the weekly average minimum price, the consumers pay Rs.404 per quintal, the farmer receives only Rs.158 per quintal. In the case of cauliflower, whereas the customer pays Rs.1475 per quintal, the farmer receives only Rs.422 per quintal. The share of the farmer in the consumer rupee is frequently very low and varies in the range of about 30 to 70 per cent. Some of the lowest shares are seen in the case of cauliflower at 28.6 per cent, and onion at 39.1 per cent, and some of the highest shares are seen in potato at 59.1 per cent, and green-peas at 73.5

per cent. The data also shows that for the maximum prices observed, the shares received by the farmer are in general somewhat greater, indicating that the farmers get a somewhat better deal for the high quality produce. Overall the average share of the farmer in the consumer price is only 47.8 per cent for the selected vegetables.

Table 3.32 and Figure 3.6 present the analysis of prices of fruits at the consumer, retailer and the farmer levels. The results indicate that the difference in prices across these three levels is even greater in fruits as compared to vegetables. For example, on the weekly average minimum price basis, in case of mango consumer pays Rs.1260 per quintal, whereas the farmer receives only Rs.361 per quintal. In case of apple the consumer pays Rs.6143 per quintal, and the farmer receives only Rs.1594 per quintal. Thus the share of the farmer in the consumer price is very low and varies from as low as 25.2 per cent in the case of pomegranate to 57.1 per cent in the case of sapota. The pattern of a higher share for better quality produce is not seen consistently case of fruits. The only exceptions were that of mango and pomegranate. Overall the average share of farmer accounts for only 37 percent of the consumer price for the selected fruits.

Table 10: Weekly Average of Minimum and Maximum Prices - Farmer, Retailer and Consumer, and the Shares in Consumer Rupee, for Selected Vegetables

Vegetables	During the Week : Av. of Minimum			During the Week : Av. of Maximum		
	Price Received by Farmer	Retailer's Price	Consumer Price	Price Received by Farmer	Retailer's Price	Consumer Price
1. Potato (G)	450.05	521.06	761.9	575.01	652.29	957.14
(Percent share)	59.07	68.39	100	60.08	68.15	100
2. Onion(OG)	157.79	250.06	403.85	315.04	414.55	580.77
(Percent share)	39.07	61.92	100	54.25	71.38	100
3. Tomato (OG)	711.42	865.04	1584.62	1086.8	1266.47	2384.62
(Percent share)	44.9	54.59	100	45.58	53.11	100
4. Cabbage(G)	326.39	409.72	738.1	590.99	691.35	1154.76
(Percent share)	44.22	55.51	100	51.18	59.87	100
5. Cabbage(OG)	305.86	412.08	738.1	530.51	652.67	1154.76
(Percent share)	41.44	55.83	100	45.94	56.52	100
6. Cauliflower (G)	473.06	586.90	1475	726.1	855.99	1937.5
(Percent share)	32.07	39.79	100	37.48	44.18	100
7.Cauliflower (OG)	422.18	566.99	1475	660.04	828.67	1937.5
(Percent share)	28.62	38.44	100	34.07	42.77	100
8. Brinjal (G)	350.26	441.43	836.84	503.37	605.71	1215.79
(Percent share)	41.86	52.75	100	41.4	49.82	100
9.Green Pea (OG)	1647.33	1866.59	2240	2469.83	2742.43	3520
(Percent share)	73.54	83.33	100	70.17	77.91	100
9.Lady's Finger (G)	795.85	931.67	1542.5	1329.6	1490.03	2215
(Percent share)	51.59	60.40	100	60.03	67.27	100
Average	564.02	685.16	1179.59	878.73	1020.02	1705.78
(Percent share)	47.81	58.09	100	51.51	59.80	100

G - From Gujarat State OG – From outside Gujarat
 Note: Prices are per Quintal

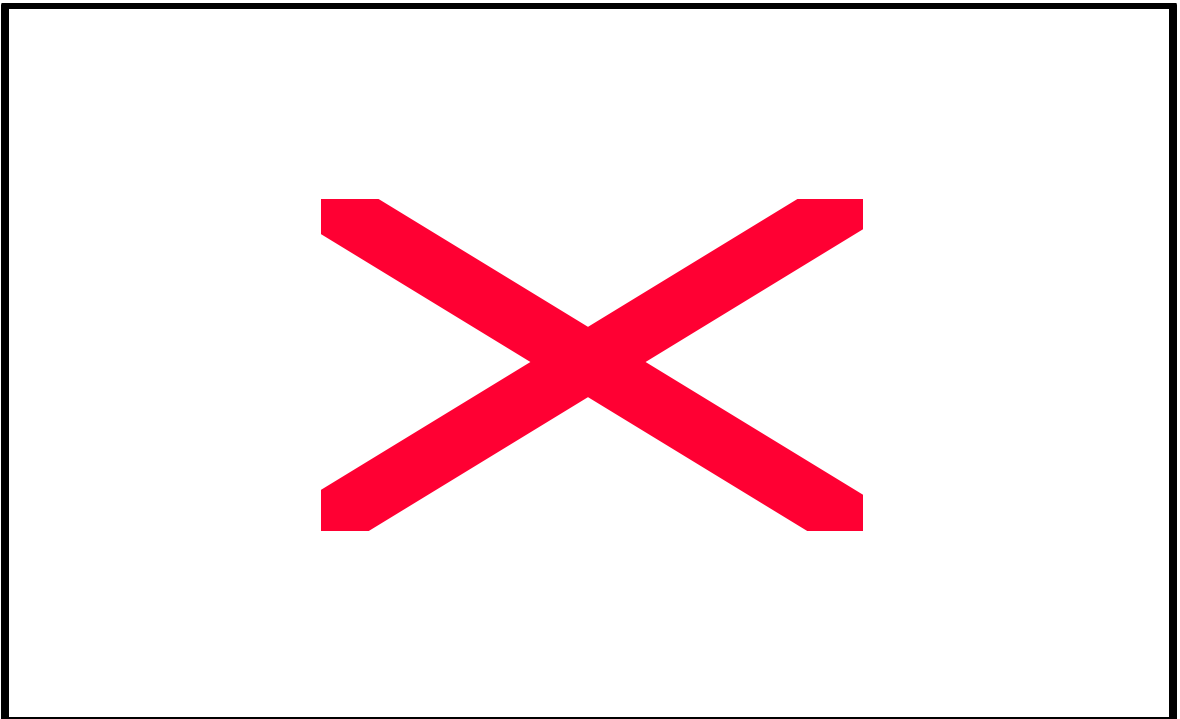
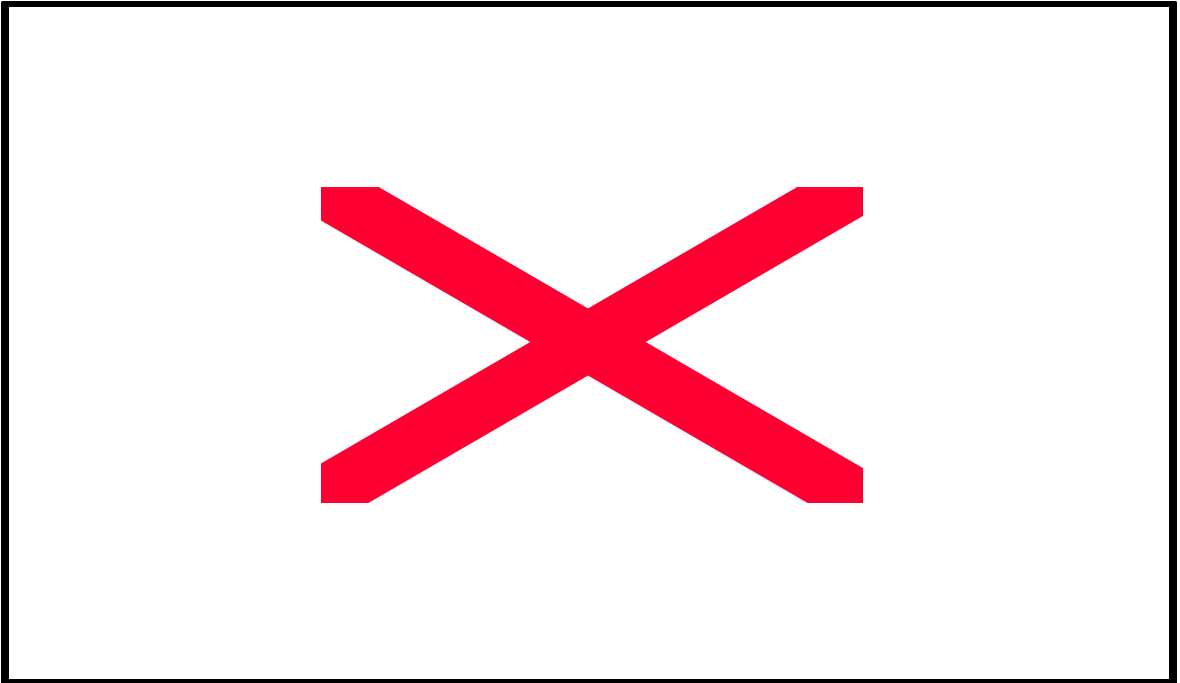
Table 11 : Weekly Average of Minimum and Maximum Prices - Farmer, Retailer and Consumer, and the Shares in Consumer Rupee, for Selected Fruits

Vegetables	Price During the Week : Minimum			Price During the Week : Maximum		
	Net Price Received by Farmer	Retailer's Price	Consumer Price	Net Price Received by Farmer	Retailer's Price	Consumer Price
1. Mango (OG)	360.67	589.30	1260	751.86	1021.50	1800
(Percent share)	28.62	46.77	100	41.77	56.75	100
2. Apple(OG)	1594.04	1925.78	6142.85	2233.56	2632.59	8714.3
(Percent share)	25.95	31.35	100	25.63	30.21	100
3. Sapota (G)	542.7	718.30	950	996.06	1219.25	2025
(Percent share)	57.13	75.61	100	49.19	60.21	100
4. Banana(G)	394.37	552.16	850	455.48	619.61	1225
(Percent share)	46.4	64.96	100	37.18	50.58	100
5. Sweet orange(OG)	18.81	26.72	56.32	22.09	30.34	65.18
(Percent share)	33.4	47.44	100	33.89	46.55	100
6. Pineapple (OG)	66	85.05	156.2	60	76.18	143
(Percent share)	42.25	54.45	100	41.96	53.27	100
7.Pomegranate(OG)	461.88	673.02	1833.35	1257.92	1552.75	2500
(Percent share)	25.19	36.71	100	50.32	62.11	100
Average	491.21	652.90	1606.96	825.28	1021.74	2353.21
(Percent share)	36.99	40.63	100	39.99	43.42	100

G - From Gujarat State

OG – From outside Gujarat

Note: For Sweet orange and Pineapple, the prices are for 1 dozen and the for the rest prices per quintal.



3.8 Analysis of Factors Influencing the Prices of Fruits and Vegetables

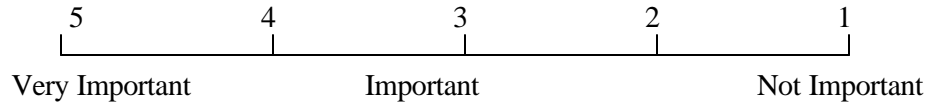
Response was also collected from the various market participants regarding what they thought were the important determinants of market prices. Table 12 provides the results in terms of average ratings obtained. In the CJP Market, which deals with potatoes and onion, the factors that stand out as being of great importance are national demand, national supply and the number of buyers and sellers. Market yard facilities are also indicated to be of moderate importance. In the SP Market, which deals mainly with green and fresh vegetables, the factors that stand out to be of great importance are local demand and supply, and the number of buyers and sellers. In the case of Naroda Fruit Market, local demand and national supply stand out as most important apart from number of buyers and sellers. In the opinion of commission agents, market yard facilities also stand out as extremely important in determining the price. Since, the number of buyers and sellers in the market stands out as consistently important – it indicates that there is great need for it to be consciously promoted by the market yards, and apart from this improving the market yard facilities can also help substantially.

Table 12 : Factors Determining Price: Weighted Average Rating of Farmers, Commission Agents and Retailers

	C J Patel Market			Sardar Patel Market			Naroda Fruits Market		
	C A	Farmer	Retailer	C A	Farmer	Retailer	C A	Farmer	Retailer
1. Local Demand	3.37	3.32	2.96	3.67	4.67	4.45	4.00	4.00	4.89
2. National Demand	4.67	4.32	4.56	3.93	4.19	3.79	3.50	3.83	3.50
3. International Demand	1.83	3.18	2.33	2.75	1.86	1.78			1.20
4. Local Supply	3.30	3.36	3.32	3.73	4.05	4.07	3.56	4.00	3.72
5. National Supply	4.33	3.96	3.33	4.03	3.95	3.96	4.20	4.08	3.61
6. International Supply	1.10	1.00			1.55	2.00		3.00	1.67
7. Number of Buyers	3.59	3.33	3.40	4.03	4.57	3.38	4.63	4.00	3.56
8. Number of Sellers	3.48	3.33	3.44	4.20	3.62	3.39	4.63	4.00	3.56

9. Market Yard Facilities	3.25	1.18	2.11	2.72	1.29	1.38	5.00	1.92	1.13
10. Communication Facility	3.86	2.67	2.33	2.67	1.71	1.00	2.38	3.00	3.17
11. Method of Sale	3.57	3.43	3.00	2.71	3.76	4.44	2.00	3.00	4.67
12. Transport Infrastructure	2.79	3.13	2.78	2.43	2.29	3.06	2.44	3.00	3.22
13. Government Policies	3.48	3.50	3.55	2.89	1.24	1.00	1.00		1.00
14. Season	2.07	2.50	2.40	3.70	4.52	4.03	4.63	4.25	3.50
15. Variety/Type	3.77	3.71	3.38	3.80	3.57	3.81	4.63	5.00	3.33
16. Processing Facilities	1.13	1.22	1.00		1.67				1.00
17. Cold Storage facilities	1.85	1.22			1.50	1.60			1.00
18. Weather Conditions	1.93	2.09	1.87	3.40	2.81	3.10	4.25	4.25	2.78

Rating Scale:



Efficiency: Price Difference, Marketing Cost and Profit Margin

Table 13 provides an analysis of the farmer to consumer price difference, the marketing cost and the implicit profit margin – for vegetables. The farmer-consumer price difference is derived from the figures given earlier on the weekly average prices with minimum and maximum mainly on quality difference. Marketing costs are also from the figures given earlier. The analysis shows that the cost frequently amounts only about to about 10 to 20 percent of the price difference. The profit margin, on the other hand, comes out very high and is frequently 80 to 90 percent of the price difference. This is indicative of possible large trader profits and relatively poor marketing efficiency. (The only factor not accounted for is spoilage and wastage).

Table 13: Vegetables: Farmer-Consumer Price Difference, Percentage Marketing Cost and Profit.

	Farmer-Consumer Price Difference Rs./ unit		Marketing Cost Rs./ unit		Cost Over Price Difference %		Profit Margin Over Price Difference %	
	Min	Max	Min	Max	Min	Max	Min	Max
Potato (G)	311.85	382.13	71.00	78.74	22.77	20.61	77.23	79.39
Onion (OG)	246.06	265.73	92.27	99.49	37.50	37.44	62.50	62.56
Tomato (OG)	873.20	1297.82	153.55	179.51	17.58	13.83	82.42	86.17
Cabbage (G)	411.71	563.77	83.33	100.40	20.24	17.81	79.76	82.19
Cabbage (OG)	432.24	624.25	106.21	122.17	24.57	19.57	75.43	80.43
Cauli flower (G)	1001.94	1211.40	113.94	129.89	11.37	10.72	88.63	89.28
Cauli flower (OG)	1052.82	1277.46	144.78	168.54	13.75	13.19	86.25	86.81
Brinjal (G)	486.58	712.42	91.14	102.38	18.73	14.37	81.27	85.63
Green pea (OG)	592.67	1050.17	219.20	272.33	36.99	25.93	63.01	74.07
Lady's finger(G)	746.65	885.40	126.22	160.34	16.90	18.11	83.10	81.89

Similar results for fruits are given in Table 14. The results indicate that the costs amount frequently to only about 20 percent of the price difference, with the exception of apple where it amounts to only 6-7 percent. The profits margin seem to be very high and amount frequently to 80 percent of the price difference, and in the case of apple to 93 percent. This is indicative of high profits and relatively poor market efficiency.

Table 14: Fruits: Farmer-Consumer Price Difference, Percentage Marketing Cost and Profit

	Farmer-Consumer Price Difference Rs./ unit		Marketing Cost Rs./ unit		Cost Over Price Difference %		Profit Margin Over Price Difference %	
	Min	Max	Min	Max	Min	Max	Min	Max
Fruits:								
Mango(OG)	899.33	1048.14	228.65	269.72	25.42	25.73	74.58	74.27
Apple(OG)	4548.81	6480.74	331.66	398.81	7.29	6.15	92.71	93.85
Sapota(G)	407.30	1028.94	175.55	223.16	43.10	21.69	56.90	78.31
Banana(G)	455.63	769.52	157.76	164.18	34.62	21.34	65.38	78.66
Sweet orange(OG)	37.51	43.09	7.91	8.25	21.09	19.15	78.91	80.85
Pine-apple(OG)	90.20	83.00	19.06	18.43	21.13	22.20	78.87	77.80
Pomagrante(OG)	1371.47	1242.08	211.21	294.79	15.40	23.73	84.60	76.27

Concluding Observations

The paper has examined the marketing of fruits and vegetables in the regulated wholesale markets of Ahmedabad, a large city of 4.5 million in western India, in light of widespread concerns about poor marketing efficiency and low share of farmers in the consumer rupee in India. The study finds that the Agricultural Produce Market Committee of Ahmedabad (APMC) has put up significant infrastructure including three regulated wholesale markets with many facilities and services. The objective of this is to improve the marketing and its efficiency for fruits and vegetables. The volume of business transacted through the markets has increased substantially to 700 thousand tons by 1998-99 and the financial viability of the APMC is very good.

Vegetables and fruits are known for their seasonality in sales and this is exhibited substantially by vegetables such as cauliflower and green peas, and fruits such as mango and apple. However, some such as potato, tomato and onion show less seasonality. The study finds that the extent of contact between farmers and commission agents is low and needs considerable improvement. It also shows that the adoption of open auctions in the markets is very low and so much potential for gain in market efficiency has not been realized.

The study finds that the share of the farmer in the consumer rupee works out to only 48 percent for vegetables and 37 percent for fruits. Further, the explicit marketing costs work out to only a very small percentage of the price difference between the farmer and the consumer, and the profit margin works out frequently to 80 to 90 percent of the price difference. These figures are indicative of relatively poor efficiency of the marketing system despite the presence of the APMC and the regulated markets.

The measures required to improve this efficiency should include wide and necessary adoption of open auction, measures to increase the number of buyers and sellers in the market, improvements in market infrastructure such as storage facilities, cold storages, loading and weighing facilities, and improving transparency through supervision, and making available up-to-date market information through various means including internet at the market.

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