Price spread, Marketing efficiency and postharvest losses in marketing of selected *kharif* vegetables in Palghar district of Maharashtra State

Abstract

Vegetables play an important role both in the regional and national economy of the agricultural sector. These crops generally of short duration. The post-harvest losses in kharif vegetables due to insufficient storage, packaging, transportation, and handling technologies for perishable crops, such as vegetables, lead to significant wastage. The present study was undertaken to estimate these losses at various stages and price spread of selected vegetables in study area. The study was conducted in Palghar district of Maharashtra, involving 90 farmers, 6 commission agents, 9 wholesalers and 30 retailers. The important kharif vegetables were identified for the detailed analysis. In of case brinjal the total postharvest losses were 12.62 kg/q. out of which maximum postharvest losses of brinjal vegetables was observed to be highest (4.62 kg/q), at retailer level followed by (3.2 kg/q) at wholesaler level and (1.65 kg/q) at commission agent level. Similarly in case of okra, postharvest losses in kharif season was estimated to 13.52 kg /q, out of which the retailers level postharvest losses was highest at (5.12 kg/q), followed by (3.78 kg /q) at wholesaler level, (2.87 kg /q) at farmer level and (1.75 kg/q) at commission agent level .Whereas for cowpea total postharvest losses was workout to 12.73 kg/q out of which 4.12 kg /q postharvest losses was observed at retailer level, 3.65 kg /q losses at wholesaler level, 3.08 kg /q at farmer level and 1.88 kg /q postharvest losses at commission agent level. In study area three channels were identified channel-I (P-CA-W-R-C), channel-II (P-W-R-C) and channel-III(P-C). Price spread of brinjal for channel-I and channel-II were Rs.2962.91and Rs.2634.72 respectively and marketing efficiency for channel-I, channel-II and channel-III were 1.01,1.24 and 33.76 respectively. Price spread of okra for channel-I and channel-II were Rs.1939.70, Rs.1733.20 respectively and marketing efficiency for channel-I, channel-II and channel-III were1.51,1.85 and 28.84 respectively. Price spread of cowpea for channel-I, channel-II were Rs.4000, Rs.3260 respectively and marketing efficiency for channel-I, channel-II and channel-III were 0.911.76 and 29.76 respectively.

KEYWORDS: Price spread, Producer share in consumer rupee, Net price and Gross price, Marketing cost, Market margin and Postharvest losses.

1.Introduction

Vegetable production provides a promising economic opportunity for reducing rural poverty and unemployment in developing countries and is a key component of farm diversification strategies. Brinjal has origin in India. Its botanical name is Solarium melongena Lit belongs to family Solanaceae. It has about 1,4 per cent protein, 4 per cent carbohydrate, 0.3 per cent fat, 0.3

per cent minerals and 1.3 per cent fibre [2]. According to 2022-23, brinjal production in india is 12810.3 thousand MT [1]. Okra (Abelmoschus esculentus (L.) Moench) is an important kharif season crop grown for its green fruits. Okra seeds also contain 14-19 per cent oil having good proportion of linoleic acid[2] . According 2022-23, okra production in india is 7252.5 thousand MT [1]. Cowpea (Vigna unguiculata) belongs to family fabaceae. The cowpea grain is highly nutritious and contains about 22.8-28.9 % protein [2]. Cow pea production in india is 26,05.8 thousand MT [1].

Source: India agristat

2. MATERIALS AND METHODS:

The study entitled, "Economic analysis of postharvest losses in marketing of vegetables in Palghar district (M.S.)" was undertaken with the specific objective to identify postharvest losses in marketing of vegetables with a sample of 90 vegetable cultivators and 6 commission agents,9 wholesalers,30 retailers of three tahsil of Palghar *viz*. Vasai, Palghar and Dahanu during 2023-24. Palghar district will be selected purposively since this district is major producer of vegetables. The list of vegetable growing farmer has been collected from village Panchayat and from each village ten farmers has been selected randomly. The study was based on primary data. Data will be collected by personal interviews with the farmers and market intermidiaries. The special schedule will be used for this purpose.

Analysis of data:

To arrive at a useful conclusion, the data collected from the selected sample respondents will be analysed by using simple statistical tools such as arithmetic mean, average, percentage, ratios, etc.

Tabular Analysis:

The data were arranged in suitable tables and cross tables. simple statistical tools such as arthimetic, averages percentages and ratios were used for analysis. For assessing Postharvest losses in vegetables the technique of "overall farmers assessment of commodity movement system" has been used. Farmers, wholesalers, commission agents, and retailers involved in vegetable marketing were contacted and interviewed to assess the losses at different stages of marketing.

Post harvest losses (PHL) %

$$\text{Post harvest losses} = \frac{\text{Quantity purchase} - \text{Quantity sale}}{\text{Quantity purchase}} \times 100$$

$$\text{PHL} = \frac{QP - QS}{QP} \times 100$$

QP= Quantity purchase for trading

QS=Quantity sale during trading

3.RESULTS AND DISCUSSION:

Among three identified channels in study area channel-I that is producer to commission agent to wholesalers to retailer to consumer found that less efficiency of marketing channel-I. However price received by farmer per quintal for brinjal was found to be Rs.3082.09/q [6][7]and marketing cost incurred by farmer in this channel accounted to Rs.102.85/q [8]. However their produce sold to commission agent by the farmer and commission agent receive net margin in this channel was accounted Rs.449.14/q and marketing cost incurred by commission agent was worked out to Rs.87.00. Per quintal commission agent sold this produce to wholesaler at rate of Rs.3618.23 /q and wholesaler incurred marketing cost of Rs.373.00/q. However net margin received by wholesaler was estimated to Rs.852.67/q. Wholesaler sold this brinjal to retailer in the distance market at the rate of Rs.4843.90/q [14]. However marketing cost and net margin received by retailer was accounted to Rs.82.82/q and Rs.1118.28 /q. It is seen from table that the total marketing cost of brinjal in channel-I Rs.645.67/q, whereas total market margin received by market intermediaries was Rs.2420.09/q. The producer share in consumer rupee also estimated and it was found to be 49.28 per cent, whereas marketing efficiency was also worked out and it was 1.01. Similarly in channel-II brinjal was directly sold to the wholesaler and wholesaler to retailer. Because of absence of one market intermediaries the gross price received by farmer was highest than channel-I and it was found to be Rs. 3410.28 /q. The wholesalers marketing cost and net margin from this channel also estimated it was found to Rs. 372.62/q and Rs.920.40 /q [6][7][8]. However purchasing price of retailer was Rs.4703.30/q and marketing cost incurred by retailer was Rs.81.13/q. Net margin received by retailer found to be Rs.1260.57/q by selling their brinjal at rate of Rs.60.45/kg. The total marketing cost incurred by market intermediaries was Rs.562.98/q and total market margin earned by these intermediaries estimated to Rs.2180.97/q. Producer share in consumer rupee found to be 54.61 per cent and marketing efficiency was 1.24. In case of marketing channel-III producer were directly selling their produce to consumer without market intermediaries in the market. The producer received highest gross price of Rs.5740/q [9][10], due to absence of any other market intermediaries. So the Producer share in consumer rupee was therefore found to be highest 97.04 per cent and marketing efficiency was 33.76 [11].

Table 1. Price spread and marketing efficiency of brinjal in kharif season (Rs/q)

Particulars	Channel-I (P-CA-W-R-C)	Channel-II (P-W-R-C)	Channel-III (P-C)
Producer			
Gross price received by producer	3082.09	3410.28	5740.00
Marketing cost incurred by producer	102.85	109.23	170.00
Net price received by producer	2979.24	3301.05	5570.000
Commission Agent			
Purchase price	3082.09	-	-
Marketing Cost incurred	87.00	-	-
Net margin	449.14	-	-
Selling price	3618.23	-	-
Wholesaler			
Purchase price	3618.23	3410.28	-
Marketing Cost incurred	373.00	372.62	-
Net margin	852.67	920.40	-
Selling price	4843.90	4703.30	-
Retailer			
Purchase price	4843.90	4703.30	-
Marketing Cost incurred	82.82	81.13	-
Net margin	1118.28	1260.57	-
Selling price	6045	6045	-
Consumer			
Purchase Price of consumer	6045 (100.00)	6045 (100.00)	5740.00 (100.00)
Total Marketing cost	645.67 (10.68)	562.98 (9.31)	170.00 (2.96)
Total marketing Margin	2420.09	2180.97	-
Price spread	2962.91	2634.72	-
Producers share in Consumers rupees (%)	49.28	54.61	97.04
ME	1.01	1.24	33.76

Therefore it is indicated from table that as market intermediaries are most hurdles in the marketing of brinjal and because of them producer share in consumer rupee was very less as well as marketing efficiency also adversely affects due to presence of market intermediarie in brinjal.

Table .2 Price spread and marketing efficiency of okra in kharif season (Rs/q)

Particulars	Channel-I (P-CA-W-R-C)	Channel-II (P-W-R-C)	Channel-III (P-C)
Producer			
Gross price received by producer	3080.30	3412.10	4745.30
Marketing cost incurred by producer	102.52	109.23	164.52
Net price received by producer	2977.78	3302.87	4580.780
Commission Agent			
Purchase price	3080.30	-	-
Marketing Cost incurred	57.31	-	-
Net margin	497.49	-	-
Selling price	3635.10	-	-
Wholesaler			
Purchase price	3635.10	3412.10	-
Marketing Cost incurred	275.10	248.23	-
Net margin	299.93	444.77	-
Selling price	4210.13	4105.10	-
Retailer			
Purchase price	4210.13	4105.10	-
Marketing Cost incurred	78.84	82.05	-
Net margin	731.03	958.15	-
Selling price	5020	5145.30	-
Consumer			
Purchase Price of consumer	5020 (100.00)	5145.30 (100.00)	4745.30 (100.00)
Total Marketing cost	513.77 (10.23)	439.50 (8.54)	164.52 (3.46)
Total marketing Margin	1528.45	1402.93	-
Price spread	1939.70	1733.20	-
Producers share in Consumers rupees (%)	59.32	64.19	96.53
ME	1.51	1.85	28.84

The per quintal price received by farmer by selling produce to commission agent was found to be Rs.3080.30/q. The price spread of channel-I was Rs.1939.70 [17]. It is seen from table that the total marketing cost incurred by market intermediaries was Rs.513.77/q and total market margin earned by these intermediaries estimated to Rs.1528.45/q [15]. The producer share in consumer rupee found to be 59.32 per cent with marketing efficiency was 1.51 in channel-I.

Similarly in channel-II okra was directly sold to the wholesaler and wholesaler to retailer. It is seen from table that the total marketing cost of okra in channel-II was Rs.439.50/q [12][13], whereas total market margin received by market intermediaries was Rs. 1402.93/q. The producer share in consumer rupee also estimated and it was found to be 64.19 per cent, with marketing efficiency of 1.85. The marketing channel-III were producer directly sold their produce to consumer without market intermediaries in the market. The producer received highest gross price of Rs. 4745.30/q. So the Producer share in consumer rupee was therefore found to be highest 96.53 per cent [13] and marketing efficiency was 28.84.

Table .3 Price spread and marketing efficiency of cowpea in kharif season (Rs/q)

Particulars	Channel-I (P-CA-W-R-C)	Channel-II (P-W-R-C)	Channel-III (P-C)
Producer			
Gross price received by producer	3550.00	4020.00	4950.00
Marketing cost incurred by producer	108.23	120.62	166.32
Net price received by producer	3441.77	3899.38	4783.680
Commission Agent			
Purchase price	3550.00	-	-
Marketing Cost incurred	249.42	-	-
Net margin	1050.58	-	-
Selling price	4850.00	-	-
Wholesaler			
Purchase price	4850.00	4929.38	-
Marketing Cost incurred	416.91	408.41	-
Net margin	743.29	312.21	-
Selling price	6010.20	5650.00	-
Retailer			
Purchase price	6010.20	5650.00	-
Marketing Cost incurred	89.29	104.73	-
Net margin	1250.51	1525.27	-
Selling price	7350.00	7280.00	-
Consumer			
Purchase Price of consumer	7550.00 (100.00)	7280.00 (100.00)	4950.00 (100.00)
Total Marketing cost	863.86 (11.44)	633.76 (8.70)	166.32 (3.36)
Total marketing Margin	3044.37	1645.89	-
Price spread	4000.00	3260.00	-
Producers share in Consumers rupees (%)	45.59	53.56	96.64

ME	0.91	1.76	29.76

The price received by farmer per quintal for cowpea was found to be Rs.3550/q [16] in channel-I and marketing cost incurred by farmer in this channel accounted to Rs.108.23/q. However farmers sold their produce sold to commission agent and commission agent receive net margin in this channel was accounted Rs.1050.58/q and marketing cost incurred by commission agent was worked out to Rs.249.42 [19]. commission agent sell this produce to wholesaler at the rate of Rs. 4850 /q and wholesaler incurred the marketing cost of Rs.416.19/q. However net margin received by wholesaler was estimated to Rs.743.29/q. wholesaler sold this cowpea to retailer in the distance market at rate of Rs.6010.20/q. However marketing cost and net margin received by retailer was accounted to Rs.89.29/q and Rs.1250.51/q [16][17]. It is seen from table that the total marketing cost of cowpea in channel-I was Rs. 863.86/q, whereas total market margin received by market intermediaries was Rs. 3044.37/q [19]. The producer share in consumer rupee also estimated and it was found to be 45.59 per cent, and marketing efficiency was also worked out and it was 0.91. Similarly in channel-II cowpea was directly sold to the wholesaler and wholesaler to retailer. The wholesalers marketing cost and net margin from this channel also estimated and it was found to Rs.408.41/q and Rs.312.21/q. However purchasing price of retailer was Rs.5650/q and marketing cost incurred by retailer was Rs.104.73/q [19][21]. The net margin received by retailer found to be Rs.1525.27/q by selling their cowpea at rate of Rs.72.80/kg. The total marketing cost incurred by market intermediaries was Rs.633.76/q and total market margin earned by these intermediaries estimated to Rs.1645.89/q. Producer share in consumer rupee found to be 53.56 per cent and marketing efficiency was 1.76. In the marketing channel-III producer were directly sold his produce to consumer without market intermediaries in the market. The producer received highest gross price of rupees 4950/q. So the Producer share in consumer rupee was therefore found to be highest 96.64 per cent and marketing efficiency was 29.76 [21].

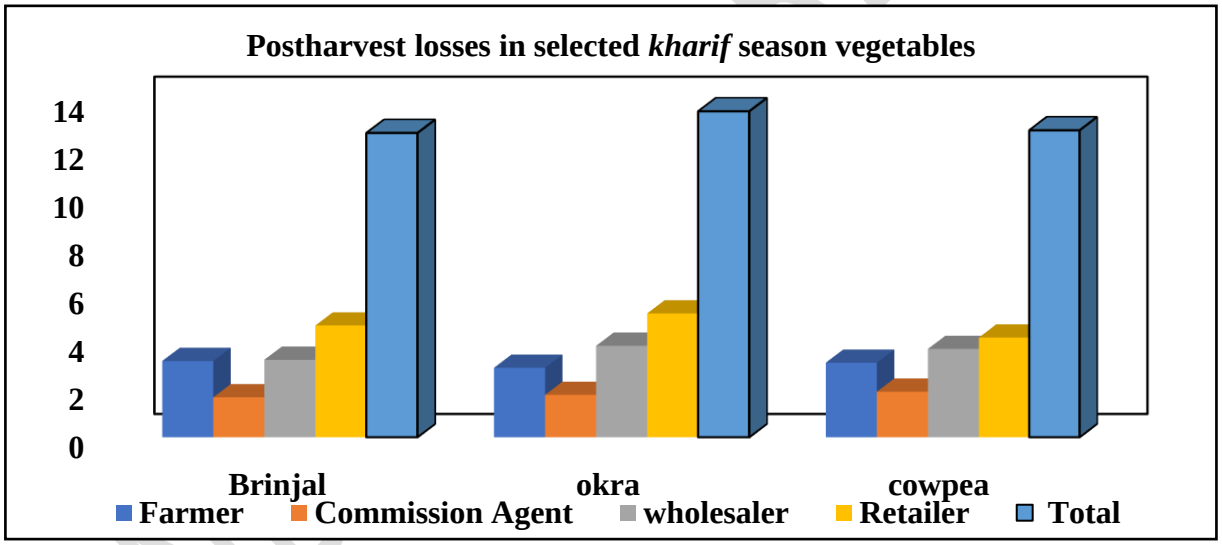
Per quintal postharvest losses of vegetables in kharif season presented in Table no.4

Table no. 4 Per quintal post-harvest losses of selected vegetables in kharif Season (Kg/q)

Vegetables	Farmer (N=90)	Commission Agent (N=6)	Wholesaler (N=9)	Retailer (N=30)	Total
Brinjal	3.15 (24.96)	1.65 (13.07)	3.2 (25.36)	4.62 (36.61)	12.62 (100.00)
okra	2.87 (21.23)	1.75 (12.94)	3.78 (27.96)	5.12 (37.87)	13.52 (100.00)
Cowpea	3.08 (24.19)	1.88 (14.77)	3.65 (28.67)	4.12 (32.36)	12.73 (100.00)

The per quintal postharvest losses of vegetables during kharif season in the study area were estimated at various stages including farmers, commission agent, wholesaler and retailers. Who are the primary and secondary, market intermediaries in the marketing of vegetables. It is revealed from table that in case brinjal the total postharvest losses estimated to 12.62 kg per quintal [3][4], out of which maximum postharvest losses of brinjal vegetables was observed to be highest (36.61%) and (4.62 kg/q) [18][19][20] ,at retailer level followed by 25.36 per cent (3.2 kg/q) at wholesaler level and 13.07 per cent (1.65 kg/q) at commission agent level .Similarly in case of okra, postharvest losses in kharif season was estimated to 13.52 kg /q [18], out of which the retailers level postharvest losses was highest and accounted to 37.87 per cent (5.12 kg/q) [20], followed by 27.96 per cent (3.78 kg /q) at wholesaler level, 21.23 per cent (2.87 kg /q) at farmer level [19] and 12.94 per cent (1.75 kg/q) [18][19] and at commission agent level .Whereas for cowpea total postharvest losses was workout to 12.73 kg/q [21][19] out of which 4.12 kg /q [19] postharvest losses was observed at retailer level, 3.65 kg /q losses at wholesaler level, 3.08 kg /q at farmer level [21] and 1.88 kg /q postharvest losses at commission agent level.

Fig.1 Postharvest losses in selected *kharif* season vegetables



4. CONCLUSION:

Postharvest losses in kharif season vegetables were highest in okra, cowpea, brinjal with 13.52 kg/q, 12.73 kg/q,12.62 kg/q respectively. Maximum losses were at retailer level 5.12 kg/q, 4.12 kg/q ,4.62 kg/q respectively, followed by losses were at wholesaler level 3.78 kg/q, 3.65 kg/q,3.20 kg/q respectively, followed by losses were at farmer level 2.87 kg/q,3.08 kg/q,3.15 kg/q, followed by losses were at commission agent 1.75 kg/q,1.88 kg/q,1.65 kg/q respectively.

For brinjal in kharif season the producer share in consumer rupee (PSCR) was lowest in channel-I (49.28%), 54.61 per cent in channel-II and highest in channel -III (97.04%) with marketing efficiency for channel-I, channel-II and channel -III was 1.01, 1.24, 33.76 respectively.

For okra in kharif season the producer share in consumer rupee (PSCR) was lowest in channel-I (59.32%), 64.19 per cent channel-II and highest in channel-III (96.53%) with marketing efficiency for channel-I, channel-II and channel -III was 1.51,1.85, 28.84 respectively.

For cowpea in kharif season the producer share in consumer rupee (PSCR) was lowest in channel-I (45.59%), 53.56 per cent channel-II and highest in channel-III (96.64%) with marketing efficiency for channel-I, channel-II and channel -III was 0.91,1.76, 29.76 respectively.

DISCLAIMER (ARTIFICIAL INTELLIGENCE):

Author(s) hereby declares that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

REFERENCES:

1. Anonymous (2023) India stat agri. https://www.indiastatagri.com/
2. NIN national institute of nutrition
3. Arunkumar R. 2018. Economic analysis of Postharvest Losses in Marketing of tomato in Eastern dry zone of Karnataka. Unpublished M.sc. (Agri) Thesis submitted to Dr. B.S.K.K.V., Dapoli.
4. Kshirsagar P, Shigawan S, Wadkar S, and Naik V (2019). Post-harvest losses of alphonso mango in South Konkan region-An economic analysis. International Research Journal of Agricultural Economics and Statistics, 10(1), 90-95.
5. Anonymous (2023) Directorate of Economics and Statistics, Government of Maharashtra. https://mahades.maharashtra.gov.in/publications.do?pubId=DSA
6. Meena S and Singh I P (2014). Price spread and efficiency of marketing of tomato in Rajasthan. *Indian journal of agricultural research, 48*(4), 294-300.
7. Sagar M, Torane S R and Yogeesh K J and Swamy P S (2016). Economic Analysis of Price Spread and Marketing Efficiency of Vegetables in Mandya District of Karnataka. *Indian Horticulture Journal, 6*(2), 175-182.
8. Yesdhanulla S and Aparna B (2018). Marketing channels and price spread of tomato in Chittoor district of Andhra Pradesh. *Journal of Pharmacognosy and Phytochemistry*, *7*(2), 873-876.
9. Mishra S, Singh R and Singh O P (2014). Economic analysis of marketing of major vegetables in varanasi district of Uttar Pradesh, India. *Economic Affairs*, *59*(4), 649-652.
10. Choudhary H, Shah R and Saryam M (2017). Hill agriculture: Marketing of vegetables in Nainital district, Uttarakhand. *Journal of Progressive Agriculture*, *8*(2), 80-88.
11. Salunke A B (2012). *Economics of production and marketing of selected vegetables in Parbhani district* (Doctoral dissertation, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani).

12. Keshari V (2021). *Production and marketing of vegetable crops in Varanasi district of Uttar Pradesh, India* (Doctoral dissertation, Department of Agricultural Economics, Institute of Agricultural Sciences, Banaras Hindu university Varanasi).
13. Gaikwad L D (2020). *Economic of production and marketing of kharif tomato in nashik distirct of maharashtra state* (Doctoral dissertation, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani).
14. Berkile M S, More S S and Waghmare Y M (2019). Marketing cost, marketing margin and price spread of Brinjal in Latur district of Maharashtra state. *Journal of Pharmacognosy and Phytochemistry*, *8*(4), 2326-2328.
15. Bandgar P B, Rathod V J and Wavdhane V P (2021). Economic analysis of tomato production in Akola district. *Journal of Pharmacognosy and Phytochemistry*, *10*(1S), 497-501.
16. Naik S R and Maurya M K (2020). An economic analysis of chickpea to estimate marketing channels, marketing cost, marketing margin and price spread in each channel of distribution in Kurnool district of Andhra Pradesh. *Journal of Pharmacognosy and Phytochemistry*, *9*(5S), 741-744.
17. Sai K S, Baba M A and Kumari R V (2022). An Economic Analysis of Okra Marketing in Siddipet District of Telangana. *International Journal of Environment and Climate Change*, *12*(10), 332-337.
18. Sharma G (2020). An Investigation on Post-harvest Losses in Marketing of Vegetables in Gujarat. *Indian Journal of Economics and Development*, *16*(1), 142-146.
19. Monika A L, Paul K S R, Devi K U, Rao V S & Swamy S G (2018). *Economic analysis of postharvest losses in chickpea in Prakasam district of Andhra Pradesh* (Doctoral dissertation, M. Sc. thesis, Acharya NG Ranga Agricultural University, Guntur, Andhra Pradesh. 131p).
20. Bondita S (2023). Post-harvest losses of onion cultivation in Kalaburagi, karnataka. *The Journal of Research ANGRAU*, *51*(2), 152-160.
21. Naik S R and Maurya M K (2020). An economic analysis of chickpea to estimate marketing channels, marketing cost, marketing margin and price spread in each channel of distribution in Kurnool district of Andhra Pradesh. *Journal of Pharmacognosy and Phytochemistry*, *9*(5S), 741-744.