



Profitability Analysis and Stakeholders Perception of Banana Value Chain in Nadia District of West Bengal

Barsha Sarkar^{1*}, Debabrata Basu², Hiralal Jana³ and Monirul Haque⁴

^{1,4}Ph.D. Research Scholar, ²Professor, Department of Agricultural Extension, BCKV, Mohanpur, Nadia-741252, West Bengal, India

³Assistant Professor, College of Agriculture, Extended Campus, BCKV, Purba Bardhaman-713101, West Bengal, India

*Corresponding author email id: barshabckv@gmail.com

ARTICLE INFO

Keywords: Value chain, Marketing efficiency, Marketing margin, Stakeholders, Producer's share in consumers rupees

<http://doi.org/10.48165/IJEE.2022.58224>

ABSTRACT

Banana occupies the highest rank among India's fruit crops both in area and production. The study was conducted on four randomly selected banana marketing channels namely Habibpur to Kolkata marketing channel (Channel-I), Habibpur local marketing channel (Channel-II), Kalyani to Kolkata marketing channel (Channel-III), and Kalyani local marketing channel (Channel-IV) of Nadia District of West Bengal during 2019 to identify marketing efficiency of the channels and comparing them in respect of value chain management (VCM) abilities. The responses were collected from forty producers, sixteen commission agents, thirty wholesalers, forty-four retailers, and twenty consumers of the marketing channel through a structured interview schedule. It was observed that the marketing efficiency of the Channel-III for all of the four important banana varieties of 'Singapuri', 'Champa', 'Martaman' and 'Kanthali' were higher than the Channel-I because of its better transportation management system, storage management facilities, and value distribution index. The marketing efficiency of the local marketing channel was distinctly higher in respect of Kolkata marketing channels. Less number of the stakeholder's intervention in the local market channels might be the determining factor for it.

INTRODUCTION

For a long time, India has achieved sufficiency in agricultural as well as horticultural production which justifies that increasing production is not a major concern in the present scenario. India has reported 320.76 million tons of horticulture crop production during 2017-18, among which 102.02 million tons of fruit crops. Among the total fruit crops, Banana alone occupies 0.92 million hectares area and production of 32.59 million tons which signifies its importance itself. West Bengal is one of the leading banana producing states of the nation. It accounts for 4% of the total country's share in banana production (Horticultural Statistics at a Glance, 2018). The major varieties grown in the state are 'Singapuri', 'Champa', 'Martaman', 'Kanthali', 'Amritsagar', 'Giant Governor', 'Lacatan' etc. (Ghosh et al., 2013). The districts

that have a great share of in-state production of bananas are Hooghly, Howrah, Nadia, North 24 Parganas., Murshidabad, Malda, Bankura, Burdwan, and Purulia (Fonsah & Amin, 2017; Saha et al., 2021). Though productivity of the state is too high, more than 90 per cent of the production follows the traditional way of the supply chain which causes a huge post-harvest loss at each stage of the value chain (Oberoi & Dinesh, 2019). In terms of profitability, employment, and air pollution emissions, the value chain has an advantage, but it also has constraints in terms of coordination, value share, profit margin, market diversity, product and market knowledge, transportation, waste management, and safety and hygiene (Gebre et al., 2020) while developing an integrated value chain can also be a low-cost method to increase farmer income and food security (Kuijpers, 2020).

Marketing of the fruit crop is a great challenge due to its high perishability and bulky nature. The fruits crops are mostly sold through unorganized marketing channels (Ray, 2020) which causes huge post-harvest wastage and quality inferiority. This leads to income fluctuation, affecting the livelihood of the farmers (Chand et al., 2021). India has noticeable area coverage, effective productivity, and year-wide availability of bananas. Despite having favorable geographical as well as climatic conditions actual potentials are yet to be realized due to poor post-harvest management, fragmented and small farm sizes, and inadequate connectivity to global markets (Wardhan et al., 2022). To mitigate these drawbacks a VCM can play a significant role which can be facilitated by forming a cooperative marketing network or the Farmer Producer Company (Roy et al., 2022) for analyzing effective marketing channels and ensuring equitable value distribution among the stakeholders engaged in every turn of the channel (Trienekens, 2011). It seeks to address the major constraints at each level of the supply chain, rather than focusing on just one group or one geographical location (Webber & Labaste, 2009). Development of the banana value chain requires technical feasibility with the system’s innovation potential along with efficient management of constraints related to economic and cultural difficulties (Fiallos-Cárdenas et al., 2022). The present study tries to identify different marketing channels of bananas, analyzing the marketing efficiency of the channels and different stakeholders’ perspectives of VCM in the Nadia district of West Bengal.

METHODOLOGY

The present study was conducted on four purposely selected banana marketing channels of Nadia district of West Bengal in the year 2019. The district was selected as it has a huge production capacity and the strongest marketing channels of the crops. Total 150 stakeholders (producers, traders/primary stakeholders, secondary stakeholders, retailers, and consumers) were randomly selected as a sample from all the marketing channels of the research. Some important terminology used in the research work are explained here-

Price spread = (Retail price - Producer price); Marketing margin = (Retail price- Production cost)

Producer’s share in consumer’s rupee (Ps) and Marketing efficiency (ME) were calculated by using the formula suggested by Acharya & Agarwal (2005),

$$Ps = (FP/ RP) \times 100$$

Where, Ps = producer’s share in consumer’s rupees, FP = Producer’s price, RP = Retail price

$$ME = FP / (MC+MM)$$

Where, Marketing Efficiency (ME), Total Marketing Costs (MC), Net Marketing Margins (MM), Prices Received by the Farmers (FP).

$$\text{Value Addition \%} = \frac{\text{Added value in each level}}{\text{Total added value in the channel}} \times 100$$

$$\text{Index value} = \frac{\{(f_1x_1) + (f_2x_2) + (f_3x_3) + (f_4x_4) + (f_5x_5)\}}{\text{Total frequency}}$$

Where, x_1, x_2, x_3, x_4 and x_5 were score value of the five-point scale and f_1, f_2, f_3, f_4 and f_5 were score wise frequencies (Ray & Mondal, 2011).

Spearman’s rank correlation coefficient (r_s): It measures the degree of similarity between two rankings using a monotonic function (Kumar & Abirami, 2018),

$$r_s = \frac{1 - 6\sum d_i^2}{n(n^2 - 1)}$$

Where, d_i = Difference between the two ranks of each observation, n = Number of observations.

RESULTS AND DISCUSSION

Profitability analysis among selected marketing channels

Selected marketing channels of bananas were analyzed based on some imperative data viz. cost of production, value distribution, marketing margin, price spread, producer’s share, etc. in the present study is diagrammatically presented in Figure 1. The study reveals that around sixty-seven per cent of banana producers of Ramlaxshmitala village of Santipur block was marketing their produce through Channel-I. They directly brought their produce to the Arat and sold it through commission agents. Small or marginal farmers of the village with a low volume of products was sold their product in the local market through Channel-II. In the case of Saguna village of Chakdah block, around eighty-five per cent of the banana growers follow Channel-III. The market was near the Kalyani Ghoshpara railway station which may reduce the transportation cost and post-harvest wastage and make the channel profitable for the bulk producer. In Channel-IV farmers brought their produce to the local market of Kalyani and sold through open auctions and brought a better price. The commission agent is not directly taking part in the marketing channels. They obtain six per cent of the producer’s selling price due to developing and maintaining the bulk selling platform. Habibpur banana market was located beside the National Highway-34 which facilitates transportation of the market

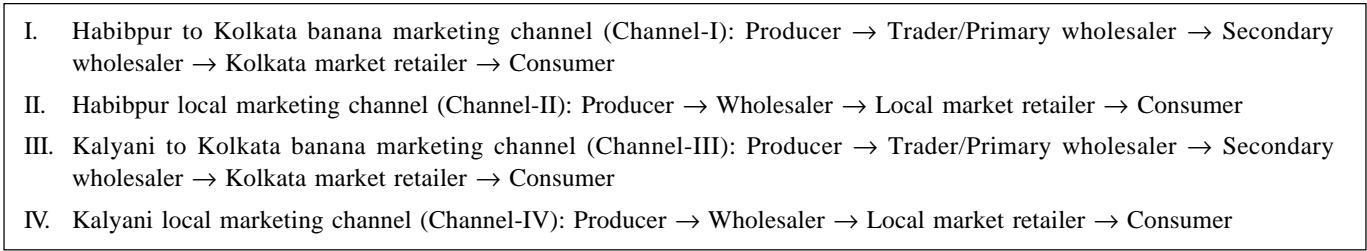


Figure 1. Diagramatic representation of selected marketing channels

Table 1. Marketing margin, producer share in consumer's rupees, and marketing efficiency of selected marketing channels

Banana varieties	Marketing Channel	Rupees per bunch price levels (150 pieces)						
		FP	RP	TMC	MM	AV	ME	PS
Singapuri and Champa	Channel-I	132.50	715.00	185.00	582.50	475.00	0.17	18.27
	Channel-III	147.50	715.00	153.00	567.50	514.00	0.20	20.50
Martaman	Channel-I	167.50	900.00	289.50	732.50	534.00	0.16	18.50
	Channel-III	170.00	900.00	235.00	730.00	594.00	0.17	18.83
Kanthali	Channel-I	187.50	1025.00	331.00	837.50	612.50	0.15	18.20
	Channel-III	148.75	1025.00	307.50	837.50	645.00	0.16	18.19
Singapuri and Champa	Channel-I	132.50	715.00	185.00	582.50	475.00	0.17	18.27
	Channel-II	80.00	562.50	107.00	415.00	403.50	0.29	26.12
Martaman	Channel-I	167.50	900.00	289.50	732.50	534.00	0.16	18.50
	Channel-II	180.00	650.00	97.00	470.00	470.50	0.31	27.57
Kanthali	Channel-I	187.50	1025.00	331.00	837.50	612.50	0.15	18.20
	Channel-II	202.50	750.00	118.50	547.50	554.00	0.30	26.81
Singapuri and Champa	Channel-III	147.50	715.00	153.00	567.50	514.00	0.20	20.50
	Channel-IV	167.50	637.50	82.00	470.00	498.50	0.30	26.19
Martaman	Channel-III	170.00	900.00	235.00	730.00	594.00	0.17	18.83
	Channel-IV	187.50	687.50	88.00	500.00	531.00	0.32	26.97
Kanthali	Channel-III	148.75	1025.00	307.50	837.50	645.00	0.16	18.19
	Channel-IV	212.50	752.50	95.00	540.00	582.50	0.34	28.17

FP= Price Received by Farmers; RP= Retail Price; TMC= Total Marketing cost; MM= Marketing Margin; AV= Added Value; ME= Marketing Efficiency; PS= Producer's Share in Consumers Rupees.

by truck. Hiking price of petrol, fruit quality reduction due to jerking, loading-unloading cost make the marketing cost higher than the Channel-III, which was situated near to the Kalyani Ghoshpara railway station. The price received by the farmers for a bunch of 150 pieces of banana was about Rs. 132.50 for Singapuri and Champa, Rs. 167.50 for Martaman, and Rs.187.50 for Kanthali, for which the consumer paid Rs. 715, Rs. 900 and Rs. 1025 respectively in the Channel-I.

In case of Channel-III farmers received Rs. 147.50 for Singapuri & Champa, Rs. 170 for Martaman and Rs. 148.75 for Kanthali for the consumer rupees Rs. 715, Rs. 900 and Rs.1025 gradually. Table 1 presents the estimation of marketing margin, producer share in consumer's rupees, and marketing efficiency of selected three marketing channels. The margins earned by producers, primary wholesalers, secondary wholesalers, and retailers of channel-I were 13.51, 20.25, 24.74 and 39.93 per cent and for the channel-III, it was 15.98,17.13, 24.21 and 39.50 per cent consequently. Producers' share in consumer rupees was 18.27 for Singapuri and Champa, 18.50 for Martaman, and 18.20 for Kanthali banana variety, and the marketing efficiency of Channel-I was highest for Singapuri and Champa varieties (0.17) followed by Martaman (0.16) and Kanthali (0.15) banana varieties. Marketing efficiency (Singapuri and Champa - 0.20, Martaman - 0.17 and Kanthali - 0.16) and producers' share in consumer rupees (Singapuri and Champa - 20.50, Martaman-18.83 and Kanthali - 18.19) both are higher in the case of Channel-III for all the varieties than Channel-I.

Marketing efficiency and producer's share in consumer rupees in Habibpur local marketing channel (Channel-II) were highest for Martaman varieties (ME=0.31; PS=27.75) whereas Kalyani local marketing channel (Channel-IV) Kanthali varieties (ME=0.34, PS=28.17) seems as most suitable might be because of its high local consumers' preference which can be mitigated by value addition (Rajavardhan et al., 2020). It also reveals that both the local

marketing channels are more efficient than the Kolkata market based on value distribution and producer share in consumers' rupees. A similar study also revealed that the losses incurred during the marketing is a main concern due to unavailability of scientific storage and packaging (Singh et al., 2021) along with reduction of stakeholders' interference was the prime reason behind the effectiveness of local marketing channels. Both the producer and consumer are at loss in the longer marketing chains and intermediaries reap the major portion of the benefit (Nain et al., 2019). Gibbon (2003) suggests that reduction of the strong influence of the intermediaries, establishment of alternative marketing channels, equivalent value distribution among the stakeholders can upgrade the marketing efficiency of the fruits and vegetables marketing channel. Local marketing channels also gain other advantages like low transportation cost, less wastage, no packaging and grading cost, etc. Development of a proper cold storage facility with various temperature settings for the different fruit crops and vegetables, which reduce the postharvest wastage and improve quality management was suggested by Chand et al., (2021) in their similar study. Though the study explains local marketing channels as most suitable for all the four banana varieties, the majority of the stakeholders prefer Kolkata marketing channels due to their profuse accessibility. A similar study also suggests that quick engagement of price indicators, logistical advantage, good communication facilities, and transport services play an effective role to improve marketing efficiency Saha et al., (2021).

Stakeholders' perception ranking on Value Chain management

The stakeholders' perception ranking on VCM (Table 2) suggests that the stakeholders of Habibpur marketing channels were specialized in mostly production management (4.16) followed by biosecurity management (4.09), stakeholder's perception power (4.08) whereas they have lacked in market information management

Table 2. Spearman's rank correlation of stakeholders' perception on VCM between selected marketing channels

S.No.	Particulars	HMC		KMC		Spearman's rank correlation
		Index value	Rank	Index value	Rank	
1	Biosecurity management	4.09	2	4.41	1	$r_s = 0.675^{**}$
2	Consumer preference	4.07	4	3.84	9	
3	Equivalent value distribution	2.67	13	3.80	11	
4	Grading and packaging	4.05	5	3.88	8	
5	Input management	3.88	7	3.91	6	
6	Market information management	2.89	12	3.51	15	
7	Post-harvest handling	3.25	9	3.83	10	
8	Product quality management	3.95	6	4.11	5	
9	Production management	4.16	1	4.21	2	
10	Proper channel management	3.12	10	3.91	7	
11	Skilled labour management	3.05	11	3.67	13	
12	Stakeholder's perception power	4.08	3	4.20	3	
13	Storage facilities	2.32	15	3.64	14	
14	Technology management	3.29	8	3.73	12	
15	Transportation management	2.53	14	4.11	4	

** n= 15; Correlation is significant at the 0.01 level (2-tailed); Habibpur marketing channels - (HMC); Kalyani marketing channel - (KMC)

(2.89), value distribution management (2.67), transportation management (2.53), and most extremely in storage management (2.32). In the case of Kalyani marketing channels, had revealed that stakeholders were focused on skills in bio-security management (4.41), production management (4.21), stakeholder's perception power (4.20), transportation management (4.11), whereas they are least concerned about technology management (3.73), skilled labour management (3.67), and storage facilities (3.64) and market information management skill (3.51). Spearman's rank correlation coefficient between stakeholders' perception about VCM of banana of Habibpur marketing channels and Kalyani marketing channels reveals that there is a strong relationship ($r_s = 0.675$) is present between the selected marketing channels which suggest that stakeholders' perceptions about VCM practices were closely related for all of the channels. While a similar finding also suggests that identification of consumer need-based value addition can played a significant role to make the channel efficient (Anastasiadis & van Dam, 2014).

CONCLUSION

Strategies to enhance marketing efficiency of fruits would vary according to nature of produce and the kind of marketing facilities in a particular region. The present study reveals that minimization of stakeholders' level can maximizing marketing efficiency and also producer's share. The producers are suffering with low margin from the middlemen because of their poor knowledge about market information, consumer demand, improper post-harvest handling, storage, transportation as well as the whole value chain management system. To overcome the problems, small fruit growers can be strengthened by cooperatives/ producer organizer groups for trouble-free disposal of produce and better bargaining power. Beside its endorsement of cold storage facilities, reduction of strong influence of the intermediaries, establishment of alternative marketing channels like contract farming and farmers' producer companies etc. and proper awareness about effective and efficient value chain management can enhance stakeholders' income through proper value chain management.

REFERENCES

- Acharya, S. S., & Agarwal, N. L. (2005). *Agricultural Marketing in India*. Oxford & IBH Publishing Co. (P) Ltd, New Delhi.
- Anastasiadis, F., & van Dam, Y. K. (2014). Consumer driven supply chains: the case of Dutch organic tomato. *Agricultural Engineering International*, (Special Issue), 11–20.
- Chand, K., Suresh, A., Dastagiri, M. B., Kumar, S., & Mandal, S. (2021). *Fruit marketing, its efficiency and supply chain constraints in India: A Case Study*, 91(8), 1146–1150.
- Fiallos-Cárdenas, M., Pérez-Martínez, S., & Ramirez, A. D. (2022). Prospectives for the development of a circular bioeconomy around the banana value chain. *Sustainable Production and Consumption*, 30, 541–555. <https://doi.org/10.1016/j.spc.2021.12.014>
- Fonsah, E. G., & Amin, B. (2017). Evaluating overall performances of the banana industry in West Bengal State, India. *Journal of Food Distribution Research*, 48(1), 16–21.
- Gebre, G. G., Rik, E., & Kijne, A. (2020). Analysis of banana value chain in Ethiopia: Approaches to sustainable value chain development. *Cogent Food & Agriculture*, 6(1), 1742516. <https://doi.org/10.1080/23311932.2020.1742516>
- Ghosh, S., Das, A., Ghorai, A., & Jha, T. B. (2013). Comparative kayomorphology of edible Musa cultivars of West Bengal. *Caryologia: International Journal of Cytology, Cytosystematics and Cytogenetics*, 66(3), 243–250.
- Gibbon, P. (2003). Value chain governance, public regulation and entry barriers in the global fresh fruit and vegetable chain into the EU. *Development Policy Review*, 21(5 6), 615-625.
- Horticulture Statistics Division, Ministry of Agriculture & Farmers' Welfare, Government of India. (2018). *Horticultural Statistics at a Glance 2018* (p. 253). Controller of Publication.
- Kuijpers, R. (2020). Integrated Value Chain Development: Evidence from Bangladesh. *Food Policy*, 97, 101916. <https://doi.org/10.1016/j.foodpol.2020.101916>
- Kumar, A., & Abirami, S. (2018). Aspect-based opinion ranking framework for product reviews using a Spearman's rank correlation coefficient method. *Information Sciences*, 460–461, 23–41. <https://doi.org/10.1016/j.ins.2018.05.003>
- Nain, M. S., Singh, R., Mishra, J. R., Sharma, J. P., Singh, A. K., Kumar, A., Gills, R., & Suman, R. S. (2019). Maximising farm

- profitability through entrepreneurship development and farmers' innovations: feasibility analysis and action interventions. *Indian Journal of Agricultural Sciences*, 89(6), 1044-49.
- Oberoi, H. S., & Dinesh, M. R. (2019). Trends and Innovations in Value Chain Management of Tropical Fruits. *Journal of Horticultural Sciences*, 14(2), 87-97.
- Rajavardhan, M., Sethi, B., & Singh, R. (2020). Supply chain of potato in east Khasi Hills District of Meghalaya: A temporal analysis. *Indian Journal of Extension Education*, 56(2), 76-82.
- Ray, G. L., & Mondal, S. (2011). *Research methods in social sciences and extension education*. Kalyani Publishers, New Delhi.
- Ray, T. (2020). Supply Chain and Trade Practice - The Outlook for Bananas in Assam. *International Journal of Management*, 11(12), 1448-1454.
- Roy, R., Das, S., Sarkar, V., Das, B., Mondal, A., Rudra, B. C., Bhowmik, P., & Majumder, D. (2022). Marketing of Mango: Perceived constraints during normality and due to lockdown in West Bengal. *Indian Journal of Extension Education*, 58(1), 176-179.
- Saha, N., Kar, A., Jha, G., Kumar, P., Venkatesh, P., & Kumar, R. (2021). Integration of prices in major markets of onion and potato in India. *The Indian Journal of Agricultural Sciences*, 91(9), 1290-1295.
- Singh, R., Singh, N. A. K., Devi, L. G., Feroze, S. M., Chiphang, S., & Kumar, S. (2021). Estimation of Producers' Surplus of Large Cardamom in Arunachal Pradesh: A Value Chain Mapping. *Indian Journal of Extension Education*, 57(3), 41-44.
- Trienekens, J. H. (2011). Agricultural Value Chains in Developing Countries: A Framework for Analysis. *International Food and Agribusiness Management Review*, 14(2), 51-82.
- Wardhan, H., Das, S., & Gulati, A. (2022). Banana and Mango Value Chains. In: A. Gulati, K. Ganguly, & H. Wardhan (Eds.), *Agricultural Value Chains in India* (pp. 99-143). Springer.
- Webber, C. M., & Labaste, P. (2009). *Building competitiveness in Africa's agriculture: a guide to value chain concepts and applications*. World Bank Publications.