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PERFORMANCE OF WOMEN RETAILERS OF WEST BENGAL IN MARKETING OF HORTICULTURAL PRODUCTS: AN APPROACH TO STOCHASTIC FRONTIER ANALYSIS

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ABSTRACT

The present study examines the performance of female traders in marketing of vegetables, fruits and flowers in rural markets of North 24 Parganas district in West Bengal in the context of women participation, employment, earnings and their economic empowerment by using modern method of Stochastic Frontier Analysis. The results show that trading of horticultural products, especially flowers trading provides women a source of earnings and there is a huge potentiality to absorb female labour force in this trading sector. The study interestingly observed a new marketing channel followed by the female traders in addition to the existing varied common and larger market channels: Collection from Common Pool Resources (CPRs) – Retailers- Consumers. The length (no. of steps) of marketing channel is directly proportional to the consumer price and inversely proportional to the market margins of the vendors. The direct and shortest marketing channel from farmers to consumers is rare in the study area. The persistent of larger length of marketing channels in horticulture may be due to the geographical scatterings of markets and the long distance from production areas to consumption areas. The longer channels meet the demand for value-added services and it is beneficial to the distant small and marginal producer farmers, even if for large farmers also, to sale their products timely and it has potentiality to absorb unorganized labour force. There is a significant variation in price spread, market margins and marketing efficiency within and between vegetables, fruits and flowers trading. The rate of market margins varies across commodities but, on an average, it is estimated to be lower for wholesalers as compared to retailers which may be attributed by their volume of transactions. On an average, the producers (farmers) share in consumers' price is observed to be lower in case of flowers (52.3 percent) than that of in vegetables (62.4 percent). The mean efficiency score of women retailers in earnings from trading of horticultural products is estimated to be 0.739 which implies that there is a scope of increase in income of women traders to the extent of 26 per cent with the existing marketing resources in their hand and at the prevailing socio-economic and market structures. The amount of initial working capital, commodity combinations in the selling basket, scale of business, transport cost, experiences of vendors, co-operation from family members, young age of female vendors, location of the market and the distance from home are the important variables for differential performance of women retailers in horticultural marketing.

KEYWORDS:

Horticultural Markets, Women Traders, Market Margins, Frontier Analysis.

JEL Classifications:
Q13, O35, R12, R15.

I. INTRODUCTION

"You can eliminate the middlemen, but not their marketing functions."–

(R. L. Kohls & J. N. Uhl)

Today, horticulture plays an important role in increasing agricultural productivity, profitability, employment and growth of output due to its strong backward and forward linkages to other sectors of the economy. Agricultural production can increase through the enhancement of yield rates, appropriate selection and combinations of crops, extensive and intensive cultivation. But increase in agricultural production does not guarantee enhancement of income of farming community. Farm income very much depends on price of output, cost of production, ownership of different inputs, and selection of agricultural enterprises. Regarding price of output and inputs, agricultural marketing plays a critical role. The role of agricultural markets is very important to increase well-being of different stakeholders in Indian farming system and allied sectors. Recently, the income approach to Indian farming system is stimulated by the announcement of the country's agricultural vision of "Doubling Farmers' Income". In this context, the participation of female labour force in agricultural production as well as marketing is very important for faster and inclusive growth and sustainable rural transformation in the economy. Agriculture marketing is a productive process that adds form, place, time and possession utility to farm commodities **(Kohls and Uhl, 2015).** It encompasses all the trading activities involved in the flow of agricultural produce and services from the producers to the consumers. The agricultural marketing in India is a very complicated network system and it consists of a number of varied marketing channels (**Dastagiri et al, 2013; Sharma, 2014; Banerjee, 2011; ICAR, 2010; Athalye et al, 2015).** There is also intra-occupational gender earning differentials in horticulture markets **(Chakraborty and Sarkar, 2011)**. Emerging trends in horticulture production, marketing, processing and storage industry may open up avenues to female labour force as different sources of livelihood. The present study examines the performance of female traders in marketing of vegetables, fruits and flowers in rural markets of North 24 Parganas district in West Bengal in the context of women participation, employment, earnings and their economic empowerment by using modern method of Stochastic Frontier Analysis.

II.OBJECTIVES OF THE STUDY

The main objectives of the study are:

1) To examine performance of women retailers in terms of traders' efficiency in earnings from marketing of vegetables, fruits and flowers.
2) To analyze market structure, marketing costs and traders margins in marketing of different horticultural produces.
3) To identify major problems of women retailers in the trading business of vegetables, fruits and flowers and to explore potential opportunities for income and employment.
4) To suggest some policies for effective horticultural marketing and to improve income and employment for women.

III. DATA BASE AND METHODOLOGY

Data and Sample Design:

The study is mainly based on primary data. Primary data are collected from the market survey through a structured questionnaire and personal interview method. A multi stage (district – block - rural hat/market - traders) random sampling technique is used to select a total of 108 female traders of vegetables, fruits and flowers spread over the three sample markets of Bamangachi Station Market, Jublighata hat & Duttapukur hatkhola hat in Barasat-1 development block of North 24 Parganas district, West Bengal. The market survey has been carried out during 1st July 2016 to 3rd August 2016. Questionnaire cover market specific general information and individual traders survey regarding their family background and various aspects of trading (such as items, variety, price, grading, sorting, sources of traded items, marketing channels, marketing costs, traders' margins etc.

The relevant secondary data sources are: (i) Directorate of Food Processing Industries and Horticulture, and (ii) District Statistical Handbook, North 24 Parganas, Bureau of Applied Economics and Statistics, Government of West Bengal.

Methods and Techniques:

The collected data are subject to various statistical and econometric techniques for analysis of data to infer results of the study. The important variables of the study are: marketing efficiency, traders' efficiency, market margins, market channels, marketing cost, transport cost, buying and selling prices, etc. There are different concepts and indices (like Sephard's index and Acharya' modified market efficiency index) to measure marketing efficiency in the literature **(Acharya and Agarwal, 2010)**. The relative performance judgment of traders (main functionaries of the market) is another crucial dimension of marketing efficiency. The present study consider an econometric method to measure traders' efficiency (women) in earnings from marketing of vegetables, fruits and flowers with the help of modern technique of stochastic frontier analysis (SFA).

Stochastic frontier regression model (SFA) is as follows:

$$\text{Ln } Y_i = \text{Ln } \beta_0 + \beta_1 \text{Ln}(X_1 i) + \beta_2 \text{Ln}(X_2 i) + \beta_3 \text{Ln}(X_3 i) + \beta_4 PD1_i + \beta_5 PD2_i + \beta_6 MD1_i + \beta_7 MD2_i + \beta_8 AgeD_i + \beta_9 FLD_i + \beta_{10} RD_i + v_i - u_i$$

Where, Ln = log, v_i =stochastic disturbance term and u_i indicate inefficiency components of the units (traders) such that

$$v_i \sim N(0, \sigma_v^2), \text{ for } -\infty < v_i < \infty \text{ (Normal distribution) and}$$
$$u_i \sim |N(0, \sigma_u^2)|, \text{ for } u_i \geq 0, \text{ (half normal distribution)}$$

Y = Traders' earnings from trading business of horticultural commodities (Rs.), X_1 = Amount of working capital to run the business (Rs.), X_2 = Transport cost as % of sales value, X_3 = Experience (no of years running the business). We have also used some dummy explanatory variables as: Product dummy: (Base= vegetables) PD1 = 1 for fruits and 0 otherwise, PD2 = 1 for flowers and 0 otherwise; Market (spatial) dummy: (Base= Bamangachi market) MD1 = 1 for Jublighata hat and 0 otherwise, MD2 = 1 for Duttapukur hat and 0 otherwise; Age Dummy: AgeD = 1 if retailer's age is below 45 years and 0 otherwise; Labour use dummy: FLD = 1 if trading business is running solely by family labour and 0 otherwise; Traders' Religion dummy: RD = 1 for Hindu and 0 for Muslims.

Profile of the Study Area

North 24 Parganas is the most populous district in West Bengal. It lies within the Ganges-Brahmaputra delta.

Majority of the population of the district lived in urban area. Literacy rate in the district of North 24 Parganas is 84.06 percent. Gender discrimination in literacy rate is visible in the district as literacy rate of male is 87.61 per cent compare to 80.34 per cent female literacy rate. Agriculture is the main source of livelihood of rural people of North 24 Parganas. The average size of agricultural landholdings is about 0.66 ha. The type of soil varies widely from alluvial to clay loam. Major source of irrigation is Shallow tube well. Only 35.68 percent of populations are engaged in economically working activity in North 24 Parganas district. Male participation in work in the district is 57.53 per cent while female participation rate is only 12.81. Among the worker about 25 per cent are earning their livelihood from agriculture of which 17 percent workers engaged in agriculture labourer and 8 per cent worker working as cultivators. The orchard cultivation and horticulture supplements the rural economy to a desirable extent. Mango, Guava and Banana etc. are exported on a large scale. The trends in production of vegetables and fruits are shown in Figure 1. Quite a good number of agro-based industries support the economy of North 24 Parganas. A bulk of people in North 24 Parganas draws their living from the industrial sectors in the core of Kolkata, Rajarhat New Town and the Sector V of Salt Lake City as a seat of IT sector. The electrified Eastern railways and circular railways is efficiently connected the neighboring district and states. Netaji Subhas Chandra Bose International airport is situated in the district. Side by side well developed road network connects every corner of the district.

As per record of the West Bengal State Marketing Board, there is a total number of 233 hats/ Markets (out of which 166 primary hats/Markets and 67 other rural markets) in North 24 Parganas district. The study block Barasat I consists of total 18 weakly hat/markets.

All the three sample markets under study are situated in rural areas. The oldest market Jublighata hat is established in the year 1820. Duttapukur hatkhola hat is running since 1890 and the market is managed by the 'Bazaar Samity'. The youngest market, Bamangachi Station Market is an unregulated market established in the year of 1978. Bamanghachi station market opens every day in a week from 8 am to 1 pm. Transactions in Jublighata hat is taking place twice a week - Tuesday and Saturday from 2 pm to 10 pm. Duttapukur hatkhola hat opens every Wednesday and Friday from 2 pm to 10 pm. Out of the above three markets, Duttapukur hatkhola hat is the largest which is serving maximum number of buyers. The markets are situated near the railway station and national highway (NH-34 and NH-35. The main modes of transport for arrival and dispatches are motor van, mini truck, cycle and local train.

IV. ANALYSIS OF PRIMARY DATA: RESULTS AND FINDINGS

The collected primary data are analysed under different sub-sections to infer results of the study: Section A analyses socio-economic characteristics of sample women traders. Section B discusses pattern of employment and Female Participation Rate. Section C analyses market channels in marketing of horticultural commodities. Section D examines market efficiency in terms of price spread and market margins in marketing of vegetables, fruits and flowers. Section E is estimated traders' efficiency to judge relative performance of women retailers in earnings from trading and analyses some factors for differential performance of women traders in marketing of horticultural commodities.

A.Socio-economic characteristics of sample traders

Out of total sample 108 women retailers, 41 (38%) traders belong to Bamangachi Market, 40 (37%) from Jublighat hat and the rest 27 (25%) traders belong to Dattapukur hat. They are trading different types of horticultural products. There are 40 vegetables traders, 31 fruits traders and 37 flowers traders in the sample. The age of sample traders varies from 30 years to 65 years. 52.8% female traders are aged above 45 years. Regarding level of education of the sample traders, it is observed that majority of them either illiterate (24.1%) or they have attained up to primary level of education (62%). There are both Hindu and Muslim categories of traders in the markets.

B.Female participation and labour absorption in horticulture marketing

Following the head-count method (no of vendors) during the survey it is estimated that the female-male ratio is approximately 52:48 in retail markets of flowers. Such female participation rate in case of vegetables and fruits markets are found to be 14.5 per cent and 22.9 percent respectively. However, overall women participation rate is 12.81 % in North 24 Parganas district. This implies that horticulture trading in general and flower trading in particular provides women a source of employment and earnings. It is observed that most of the aged female traders are vending flowers and leafy- vegetables. The primary reason is that flowers are light-weight and easy to carry compare with fruits and vegetables. It needs less transport cost and less dependent on porters. Female flower traders in these three markets mainly sold flowers used in daily worship. In this regard, they are more devoted than men and they become easily made connection with the consumers.

Both family labour and hired labourr are engaged in these trading businesses. These labourers are used to facilitate different types of physical work in running the business mainly for transport, loading and unloading, shorting and grading, cleaning, water supply, commodity arrangement, etc. Percentage of family laborer assisting female vendors for daily transaction is the highest in Jubilighata followed by Bamangachi and Dattapukur. Whereas percentage of hired labour engaged in trading is higher (74%) in Duttapukur hat compared to other two markets. Most of the female retailers are assisted by 1-2 male (either family or hired) labour. Hired labourers are working in the horticulture market on purely temporary and contract basis. They are working simultaneously under three-four neighboring venders and they are paid very little amount of Rs. 10 to Rs. 50 per vender.

C. Market Channels

The agriculture marketing system is a very complex and expensive network of channels that includes different functions and functionaries in between farmers-producers and ultimate-consumers. The marketing activities of the wholesalers, retailers, processors, exporters, middlemen, assemblers, collectors, commission agents, farmers' organizations (FPOs) and private companies (FPCs) facilitate production, distribution, exchange, employment, value-addition and consumption of agricultural products in the country. There are several routes or channels of movement of farm products from producers to consumers in India. Literature of the subject reveals that the direct linked between farmer

producers and consumers is the shortest and efficient channels in agri-marketing in view of maximum producers share in consumers' price. However, from the view point of an integrated and holistic development of horticulture the functions or role of traders/intermediaries cannot be denied in the existing socio-economic and political conditions and on the employment ground. The persistent of larger length of marketing channels in horticultural products may be due to the geographical scatterings of markets, scale of business and the long distance from production areas to consumption areas. The existence of it meets the demand for value-added services and it is beneficial to the distant small and marginal producer farmers, even large farmers also, to sale their products timely and it increases the scope of absorption of unorganized labour force.

It is true that the marketing channels for perishable farm products like vegetables, fruits and flowers should be as short as possible. Government support to horticulture marketing is very important to the farmers-producers, processors, traders and consumers. Recently, Government has encouraging direct marketing by farmers to consumers by providing different marketing infrastructures and facilities to minimize various steps of marketing of agricultural products and to eliminate intermediaries/middlemen in the marketing channels. Government of West Bengal is also developing a number of Krishak Bazars in each district under different horticulture production and marketing schemes with the help of Central government. The establishment of such markets may help both consumers and farmers. The success of these Krishak Bazars very much depends on the volume of marketable surplus, kind of infrastructure and facilities, location of the market, connectivity to storage and processing units and accessibility to the farmers and consumers.

In the study area it is observed that female retailers generally purchase their vegetables items from Duttapukur wholesale market and Jubilighata hat, and fruits from Kole market (Bara bazaar, Kolkata) and flowers from Thakurnagar flowers market and sales to the consumers of their own markets. In addition to the direct purchase from farmers or through wholesalers (Arthdars) in these markets, the present study finds another source of their trading items, which is Common Pool Resources (CPRs). Particularly, female vendors those are weak in capital base freely collect vegetables (such as leafy vegetables like Lao data, Kalmi shak, Thankunipata, Helancha shak, Kachur shak etc), flowers (such as Durba, Aaam Pallab, Belpata) and fruits (such as mango, Ata, Taal) from CPRs. They spend one to two hours for collecting these commodities from different fields and water bodies. These women retailers are lying below poverty line. Their income level is very low. They do not get minimum subsistence level. All they have earned less than Rs. 100 per day from selling their collected products. The age of these female retailers is above 60 years.

There are mainly three marketing channels operating in the study area. Channel I: Farmers (producer) - Wholesalers (own market) – Retailers - consumers, Channel II: Farmers (producer)-Wholesalers/Retailers/Commission agents (of other Markets) – Retailers - consumers, Channel III: Collection from CPRs – Retailers- Consumers. Channel I is dominant in Duttapukur Market. Women retailers of both Jublighata hat and Bamangachi market fallow mainly Channel II and Channel III. Highest return to the traders is available in channel III where there is direct contaction between collector and consumers. Channel II provides moderate returns to the traders. The implication is that length of the marketing channel directly proportional to the consumer price and inversely proportional to the market margins of the vendors (Table 1, 2, & 3).

D. Price Spread and Market Margins

Price spread (SP-PPF) between producers (framers) and consumers at the commodity level is defined as the difference between the price received by farmers (traders' purchase price, PPF) and the price paid by consumers (traders' sales price, SP) corresponding to each transacted commodity. Whereas gross market margin is defined as the difference between sales value and purchase value per unit of the commodity in each step of a particular marketing channel. The retail market margin (gross) is equal to the difference between selling price to the consumers (SP) and purchase price from the wholesalers (PPW). Gross market margin at wholesale market is defined the difference between wholesalers' selling price received from the retailers and purchase price paid to the farmers. Marketing cost (transport cost, market fees, loading-unloading cost etc) is an important factor to estimate net market margin. Total cost of marketing is the sum of cost incurred by producer plus marketing cost increased by traders/middleman. It is very difficult to estimate commodity-wise marketing cost of horticultural products in the retail markets due to variations in transport charges and mode of transports across traders, distance, spatial variation, basis of sharing transport charge among traders in case of joint transport system, commodity combinations, number of traders of each commodity, markets fees etc. The percentage share of consumers' price received by the farmers is another crucial indicator of market efficiency.

Table 1, Table 2, and Table 3 summarize selling price, purchase price, price spread, gross market margin for both wholesale and retail markets of vegetables, fruits and flowers respectively in the study area. Within the vegetables (Table 1), market margin for potato is found to be Rs. 2 per kg in retail market but it is Rs. 3 per kg in wholesale market. Market margin is observed to highest in case of drum stick among the vegetables under study.

In case of the items which are freely collected from CPRs there is no average purchasing price only have selling prices. The selling price of some of the items are as follows: Kalmi shak (Rs5/atti), Helancha shak (Rs5/atti), Kachur shak (Rs10/ atti), Lau shak (Rs 8/ atti), Bramhi shak (Rs 5/2 atti), Thankunipata (Rs 6/ atti). In fruits market, banana and guava (most important local fruits) are found to be trading with very low margins compared to other fruits in the study markets. Fruits retailers are purchasing their products mainly from Bangao wholesale market and Kolkata Bara-Bazar wholesale market. There is no fruit wholesaler within any of the three sample markets under study. Marketing cost and initial investment amount is observed to be very high in case of fruits business compared to vegetables and flowers. Some of the fruit retailers also purchase few fruits from local village traders/farmers.

In case of flowers trading it is reported that there is wide fluctuation in prices of flowers and there is huge wastage of flowers due to lack of proper storage facilities. Women retailers are buying their products from Thakurnagar flowers market which is the largest flowers wholesale market under North 24 Parganas district in West Bengal. Market margins are observed to be very high in cases of Nilkantha and Tube rose (Table 3). Three sample markets are found to be purely retail markets in

respect of flowers marketing. There are different kinds of flowers. Marigold is the most important item of floriculture trade in the study area.Other traded items of floriculture are Nilkhanta, Hibiscus, Bell, Tube rose, Dopaty, Akanda, Bell pata, and Durba grass.

From the analysis of estimated values of different indicators it is observed that there is significant variation in price spread, market margins and marketing efficiency in terms of producers' share in consumers' price within and between vegetables, fruits and flowers in our study area. Another interesting observation is that market margins vary across commodities but, on an average, it is estimated to be low in wholesale markets as compared to retail markets of vegetables, fruits, and flowers (Figure 2). On an average, producers (farmers) share in consumers' price is observed to be lower in case of flowers (52.3 percent) than that of in marketing of vegetables (62.4%).

E. Traders' Efficiency in Horticulture Marketing

The role of traders in agri-business is very important for efficient and effective marketing of agricultural commodities. We have estimated economic efficiency of women traders in earnings from trading of horticulture commodities and the regression results obtained by using STATA software are summarized in Table 4. The mean efficiency score is significantly estimated to be 0.739 which implies the fact that women retailers can increase their income from trading business to the extent of 26 per cent with the existing resources in their hand. Initial working capital for the business, selling items combinations, location of market (spatial variation), transport cost, years of experiences, types of labour use, age of traders are very important and statistically significant explanatory variables for explaining the variations in income of women traders in horticulture marketing. These factors jointly explain the variation in income to the extent of 85 per cent ($R^2 = 0.853$) in our study area. The scale of business in terms of total investment amount positively promotes income of the traders. Marketing cost, particularly transport cost significantly reduces traders' income. Trade experience is an important factor in agricultural marketing that establishes good relations and faith with other stakeholders in the market chains. There is significantly positive impact of experience (elasticity coefficient is being 0.35) on income of women retailers. Trade commodity diversification is another important aspect to enhance income of women traders. Besides marketing infrastructure and facilities, the location of market (spatial differences) and types of market (wholesale and retail) are also important aspects of traders' income in agriculture marketing. It is also observed that more involvement and or cooperation and help from family labour in marketing of horticulture commodities greater the scope of earnings from trading for women; the corresponding regression coefficient 0.18 is statistically significant at 2.8 percent level. The age of women traders is also an important factor in agriculture marketing in rural areas. The traders' age of below 45 years can increase income significantly to the extent of 0.70 percent as compared to upper age group. The religious dummy is not statistically significant implies that there is no difference in earnings from trading between Hindu and Muslims traders.

Policy Prescriptions

The following policies may be suggested for improvement of economic and social status of women traders and for effective marketing of horticulture commodities.

1. Government should promote and encourage women traders for effective participation of female labour in horticulture marketing in West Bengal.
2. There should be arrangement of financial support to the women traders by providing institutional loan at concessional rate with instant delivery of loan and easy repayment system.
3. Appropriate marketing infrastructure and facilities should be developed not only for effective marketing of horticulture commodities but also for the improvement of health and hygiene of women traders.
4. Marketing training for women traders regarding use of modern marketing technology, access to market information, techniques of sorting, grading, storage etc should be arranged.
5. Appropriate transport and storage facilities should be arranged at minimum transport cost and storage cost for women traders of horticulture commodities.

Figure 1: Trend in Vegetables and Fruits Production in North 24 Parganas.

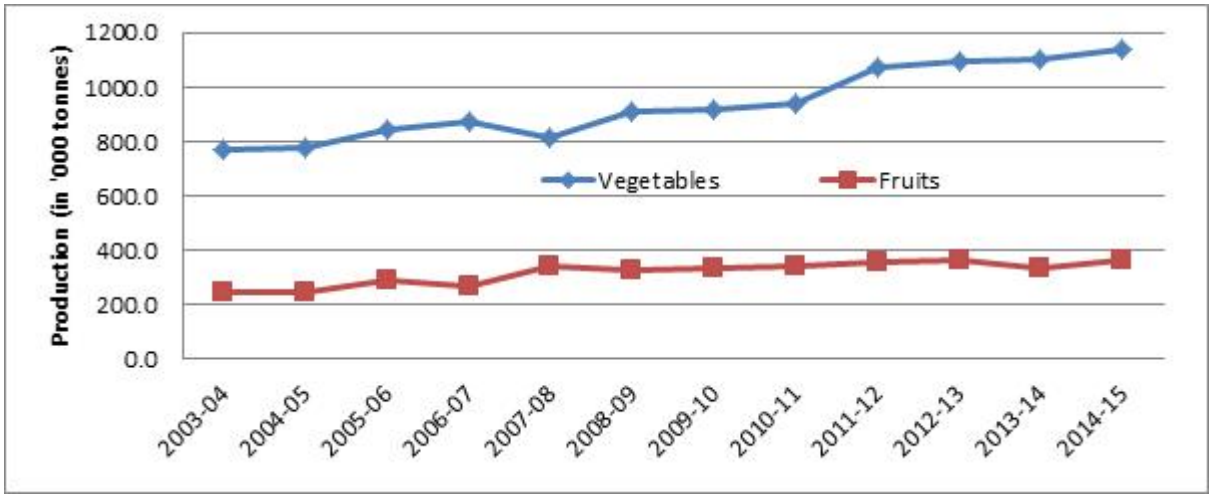

Figure 2: Gross Market Margins in Retail and Wholesale Markets of Vegetables.

Table 1: Average Selling price, Purchase Price and Marketing Efficiency in Vegetables

vegetables	Unit	Selling Price (Rs))	Purchase (from wholesalers) Price (Rs)	Purchase (from Farmers) Price (Rs.)	Price Spread (Rs.)	Market Margins (Rs.)		Producer's Share in consumer's price
						Retailers	Wholesalers	
		SP	PPW	PPF	SP-PPF	SP-PPW	PPW-PPF	PPF/SP*100
Onion	Kg	60	50	45	15	10	5	75.0
Bitter Gourd	Kg	40	30	25	15	10	5	62.5
Bottle gourd	Pc	12	10	7	5	2	3	58.3
Papaya	Kg	24	18	15	9	6	3	62.5
Cucumber	kg	40	30	25	15	10	5	62.5
Pointed gourd	kg	16	12	10	6	4	2	62.5
Tomato	Kg	70	60	55	15	10	5	78.6
Ladys'finger	Kg	10	5	4	6	5	1	40.0
Brinjal	Kg	30	22	18	12	8	4	60.0
Ash gourd	pc	10	8	6	4	2	2	60.0
Potato	Kg	20	18	15	5	2	3	75.0
Teasle gourd	pc	4	3	2	2	1	1	50.0
Drum Stick	Kg	100	85	80	20	15	5	80.0
Snake gourd	kg	15	10	7	8	5	3	46.7

Source- calculated from primary data.

Table 2: Average Selling price, Purchase Price and Marketing Efficiency in Fruits

Fruits	Unit	Selling Price (Rs)	Purchase (from other retailers) Price (Rs)	Purchase (from wholesalers) Price (Rs.)	Price Spread (Rs.)	Gross Market Margins (Rs.)	
						Retailers	Retailers (others)
		SP	PPOR	PPW	SP-PPW	SP-PPOR	PPOR-PPW
Mango	Kg	50	40	35	15	10	5
Banana	3 Pc	10	8	6	4	2	2
Orange	4 Pc	20	15	10	10	5	5
Pomegranate	Kg	80	70	65	15	10	5
Pear	Kg	90	80	75	15	10	5
Pine apple	pc	40	35	30	10	5	5
Guava	pc	5	3.5	3	2	1.5	0.5
Grapes	Kg	100	80	75	25	20	5
Safeda	pc	5	3	2.5	2.5	2	0.5

Source- calculated from primary data. Note: Farmers Prices are not available for all fruits. Main Market channel: wholesalers – Retailers (other market) – Retailers (own market)- consumers.

Table 3: Average Selling price, Purchase Price and Marketing Efficiency in Flowers

Flowers	Unit	Selling Price (Rs)	Purchase (from wholesalers) Price (Rs)	Purchase (from Farmers) Price (Rs.)	Price Spread (Rs.)	Gross Market Margins (Rs.)		Producer's Share in consumer's price
						Retailers	Whole-salers	
		SP	PPW	PPF	SP-PPF	SP-PPW	PPW-PPF	PPF/SP*100
Marigold	Garland/10 pc	60	40	35	25	20	5	58.3
Nilkhanta	Garland/ 10pc	200	50	40	160	150	10	20.0
Hibiscus	Garland/ 10pc	90	80	70	20	10	10	77.8
Bell	Pc	6	4.5	4	2	1.5	0.5	66.7
Tube rose	Garland/6 pcs	90	60	50	40	30	10	55.6
Dopaty	Loose/mutt	60	40	35	25	20	5	58.3
Akanda	Pc	7	6	4	3	1	2	57.1
Bell pata	Loose/mutt	15	10	7	8	5	3	46.7
Durba	Loose/mutt	10	5	3	7	5	2	30.0

Source- calculated from primary data.

Table 4: Estimated Stochastic Frontier Regresssion Model: Results of MLE Method

$$\ln Y_i = 3.50 + 0.35 \ln (X_1 i) - 0.33 \ln (X_2 i) + 0.35 \ln (X_3 i) - 0.01\, PD1_i + 1.14\, PD2_i +$$

(z-value) (11.55) (15.49) (-6.30) (2.59) (-0.08) (4.35)

(p-value) (0.000) (0.000) (0.000) (0.000) (0.000) (0.000)

$$+ 0.65\, MD1_i + 0.16\, MD2_i + 0.70\, AgeD_i + 0.18\, FLD_i + 0.11\, RD_i$$

(z-value) (5.59) (1.14) (3.63) (2.19) (1.00)

(p-value) (0.000) (0.253) (0.000) (0.028) (0.319)

Stoc. frontier normal/half-normal model Number of obs = 108

Wald chi2(10) = 625.03

Log likelihood = -43.076802 Prob > chi2 = 0.0000

$\sigma_v = 0.259$, $\sigma_u = 0.425$, $\sigma^2 = 0.249$, and $^{a} = 1.644$, (or ¥ = 0.781)

Mean Efficiency score = 0.739

REFERENCES

1. *Acharya, S.S & Agarwal N.L. (2010), "Agricultural Marketing in India", Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.*
2. *Athalye, A., Chouhan, H., Karjotkar, A., Nagar, A., & Mohammad, A. (2015). "Study of Supply Chain of Fruits and Vegetables for Customer Satisfaction: A Case Study of Small Town", International Journal of Science and Research (IJSR), 4(1), January 2015.*
3. *Banerjee, G.D. (2011), "Economics of Mango Cultivation", Occasional Paper – 58, Department of Economic Analysis and Research, National Bank for Agriculture and Rural Development, Mumbai.*
4. *Chakraborty, S. and Sarkar, D. (2011), "Gender Earning Differentials in Flower Trading Market in West Bengal: Capital Constraints on Women's Income". Indian Journal of Agricultural Economics. Vol.66. No.2. April-June 2011*
5. *Dastagiri, M.B., Chand, R., Immanuelraj, T.K., Hanumanthaiah, C.V., Paramsivam, P., Sidhu, R.S., Sudha, M., Mandal, S., Singh, B., Chand, K., & Kumar, B.G. (2013), "Indian vegetables: production trends, marketing efficiency and export competitiveness," American Journal of Agriculture and Forestry, 2013. 1(1).*
6. *ICAR (2010), "Estimation of Marketing Efficiency of Horticultural Commodities under different supply chain in India".*
7. *Kohls, R. L. and Uhl, J. N. (2015), "Marketing of Agricultural Products", Pearson Education, New Delhi.*
8. *Sharma, M.K. (2014), "Economic Analysis of Commercial Flower Cultivation in Sirmaur District of Himachal Pradesh", Ph.D. Thesis in Agriculture, Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur, H.P.*