VEGETABLE MARKETING IN JHARKHAND: A MICRO STUDY OF MARKETABLE AND MARKETED SURPLUS OF SELECTED VEGETABLES

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In a country which has a predominance of small land holdings and surplus labour, horticulture and vegetable cultivation, particularly the latter is most suitable. Jharkhand is one of the major producers of vegetables in our country. About 3.2% of the gross cropped area of the State is under vegetable crop. The major vegetable crops grown in the state in order of area covered by them are potato, tomato, lady finger, peas, cauliflower, brinjal, & cabbage. Growing of vegetables has added significance from the point of view of its contribution to national income and employment generation. Cultivation of vegetables is highly profitable. It has the potential of earning almost four times more income per hectare than food crops. Vegetable marketing is a complex issue because of perishability factor. Farmers producing vegetables market it only after consumption. Thus in case of vegetables, marketed surplus is very important. It is the quantum of marketed surplus that decides the choice of different market channels for the farmers. The present paper analyses the marketable and the marketed surplus of selected vegetables and its distribution in different marketing channels in three districts of Jharkhand. Using multistage random sampling method 150 vegetable cultivators were selected from Ranchi, Lohardaga and West Singhbhum districts of Jharkhand for the study. The study found that price has no impact on marketed surplus. There is a need to restructurre primary co-operative marketing societies.

Keywords : *Vegetables, Marketing Efficiency, Marketing Channel, Marketing Cost*

Introduction

Agricultural marketing is an integral part of agricultural production. Our efforts towards increasing agricultural production cannot be sustained for long unless increase in production results in increasing incomes for farmers and ensures remunerative prices and fair deals in the disposal of their produce. In a predominately agricultural country the emphasis on raising farm productivity has always received considerable attention from policy makers and planners. This has resulted into adoption of scientific inputs throughout the world and in increasing degree has been accepted as the most important component for raising agricultural production. India is the world's second largest producer of vegetable, next to China. Vegetables are grown throughout the year even then the per capita availability is about 120 gm/head / day in contrast to the recommended level of 300 gm./head/day (Kaith, 1996). So there is ample scope of improving productivity of vegetables in our country.

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Jharkhand one of the states in India is a major producer of vegetable. About 3.2% of the gross cropped area of the State is under vegetable crops. The major vegetable crops grown in the state in order of area covered by them are potato, tomato, lady finger, peas, cauliflower, brinjal, & cabbage. The varied agro-climate conditions of Jharkhand are congenial for production of a variety of vegetables throughout the year. The vegetables produced in this plateau region have special comparative advantage as these are of better quality and ready for market when these are not produced in plains. Consequently, the off-season vegetables produced in this region fetch high prices. This has made vegetable farming a highly lucrative and attractive venture for the farmers. Since there is limited scope of bringing more areas under cultivation on the plateau, vegetable farming offers great scope for multiple cropping and thus ensures economic viability for even marginal and small farmers (Deogharia, 2014).

Jharkhand is a traditional supplier of vegetables and the South Chotanagpur region has been supplying vegetables to big cities like Patna, Kolkata, Asansole, Rourkela, Jamshedpur, Bokaro and Dhanbad. Vidyarthi (1962) reported that in villages near Ranchi, a shift was visible in the cropping pattern, especially towards vegetables. Vegetables are produced and marketed largely by all size groups of farms. The 'Vegetable Village Clusters' schemes sponsored by nationalized banks and the 'Million Wells Scheme' have encouraged farmers of Jharkhand for vegetable cultivation (Sinha & Kumar, 1988). But the vegetable marketing system has not received the needed attention to handle increased production. The problem is that increased production does not increase the income level of the farmers unless marketing linkage is properly planned and implemented.

It has been observed that production and marketing of vegetables for small farmers is a profitable enterprise. Different studies such as Acharya (1994), Cummings (1976), Lele (1972), Subbha Rao (1989), Thakur (1974), Prasad (1996), Ekka and Deogharia (2005) and Deogharia (2006) have also highlighted the problems of marketing e. g. high commission charges, transport and packing cost. So, if the farmers do not get an easily accessible market outlet where they can sell their produce at a fairly reasonable price, they will have little incentive to regard vegetable cultivation as a gainful occupation. Role of agriculture marketing is so important that it has prompted the government to place particular emphasis on it.

Different aspects of vegetable marketing have also been studied by economists like Acharya (1998), Singh and Singh (1992), Srivastava (1993), Prasad (1997), Thakur, Sharma and Sahay (1994). These include marketing pattern, marketing systems, marketing margins, marketing

channels, marketing efficiency etc. Marketing efficiency has been a subject matter of paramount concern for economists from time to time. There have been some studies which analyse marketable and marketed surplus. A study has been conducted by Chauhan and Chhabra (2005), on production, marketed surplus, disposal channels, margins and price-spread for maize cultivation in the Hamirpur district of Himachal Pradesh. The study revealed that farm-level marketable surplus is comprised of 53.21% of the total production. The producer's share in consumer's rupee has been estimated at 78.01 per cent in this channel. A micro-level study conducted in West Champaran district of Bihar to assess the marketable and marketed surplus of rice has observed that there were both marketable and marketed surplus on marginal farm households. It has increased with the increase in size of land holdings with respect to quantum and proportion to rice production (Dwivedi & Jha, 2011).

Borate, Zala, Darji and Yadav (2011) have estimated the marketable and marketed surplus of red gram and to identify the factors influencing them in Vadodara district of Gujarat. The results showed that marketable surplus was positively and significantly related with cropped area and average productivity in all the four categories of farms. The questions about domestic trade in vegetables, marketing surplus, margins of market intermediaries and their impact on producer's income or consumer's prices are of much interest not only to participants of the marketing system, but also for policy makers and administrators.

Objectives of the Study

Keeping in view the economic importance of vegetables in Jharkhand, the present study was conducted in three districts of Jharkhand, namely Ranchi, Lohardaga & West Singhbhum during the agriculture year 2015 – 16 with the following objectives:

1. To estimate the marketable and marketed surplus of different size group of farmers.
2. To identify the factors determining the marketed surplus, and to identify different marketing channels for vegetables.
3. To study the marketing cost and
4. To estimate the marketing efficiency of the farmers.

The study is related to three selected vegetable crops namely potato, tomato and cauliflower only.

Methodology

Multistage stratified random sampling method was used to select vegetable cultivators in the region. Altogether 150 cultivators, 50 each from the three selected districts, were selected randomly for the study.

The sample farmers were classified into marginal, small, medium and large farmers. The data from the sample farmers were collected through personal interviews with the help of pre-tested schedules. The study analyses marketed surplus, marketing channels, marketing cost and marketing efficiency of selected vegetables.

The factors affecting the marketed surplus of vegetables were analysed by applying multiple regression analysis. The marketed surplus of vegetable (Y) was taken to depend on the following factors:

The multiple regression analysis is used for the function: $Y = f(X_1, X_2, X_3 \ldots\ldots\ldots Xn)$

Where,

Y = Marketed Surplus of Vegetables
X_1 = Family Size of the Farmers
X_2 = Area under Vegetable Crop
X_3 = Total Production of Vegetable

X_4 = Income from Vegetable
X_5 = Family Consumption
X_6 = Total Non-market Transaction
X_7 = Price of Vegetable

Apart from analyzing the marketed surplus, the marketing costs of the vegetable and the marketing efficiencies have also been analyzed. The total marketing costs comprise costs of all the functions like ground rent, marketing fee, grading, packing, transportation, etc.

Clark (1954) defined marketing efficiency as comprising three components of effectiveness, cost and their effect on performance of marketing functions and services which in turn affect production and consumption. According to Jasdanwala (1966) marketing efficiency denotes the effectiveness or competence with which market structure performs its designated function. Kohls and Uhl (1980) denotes marketing efficiency as the ratio of market output or satisfaction to marketing inputs or cost of resources in the marketing system. Thakur (1973) expressed marketing efficiency as a ratio of output to marketing input. The expounders of agricultural marketing in India who have studied and analyzed various aspects, situations, markets and marketing systems to determine their marketing efficiency and performance are Jasdanwala (1966), Cummings (1976), Lele (1967; 1972), Holmes (1971), Thakur (1974) and Deogharia (2006).

The present study also examines marketing efficiency as a ratio of output to inputs. In fact, marketing efficiency refers to the maximization of this output – input ratio.

Therefore ME = O/I

Where,

ME = Marketing efficiency.
O = Output of the marketing system.
I = Inputs used in marketing.

Accordingly, the ratio of the total value of goods marketed (0) to the total marketing cost (I) involved or incurred denotes marketing efficiency. The marketing efficiency is expressed in percentage terms as follows:

$$ME = \frac{\text{Value added by marketing system}}{\text{Cost of marketing functions services margins}} \times 100$$

Results & Discussion

Marketed surplus was estimated by deducting the requirement for family consumption, farm seeds and other payments from the farm produce of the sample farmers. The marketed surplus, on the other hand, is the actual quantity of the produce, which the producer farmer actually sold in the market, irrespective of his requirements for family consumption, farm seeds and other payments.

The marketed surplus of vegetables is presented in Table - I. It may be observed from the table that there is a very high percentage of marketable surpluses with the farmers but the absolute quantity of the marketed surplus remains very small.

The marketable and marketed surplus of samples vegetables produced by the sampled farmers in various categories of farmers in the study area revealed that the marketed surplus as proportion of production farm. However, the marketed surplus reduced to nearby 95%, 90%, and 93% of total production of potato, tomato, and cauliflower, mainly due to the post harvesting losses, because of their perishable nature. The extent of losses was estimated to be maximum in tomato (5.54%) followed by cauliflower (3.46%) and minimum in case of potato (0.64%). Both the marketable and marketed surplus of all the three vegetables showed a direct relationship with the farm size which can be observed from Table-I.

Table-1 Marketable and Marketed Surplus of Sample Vegetables on Different Categories of Sample Farms

Vegetables	Farm Size	Total Production	Marketable Surplus	Marketed Surplus
A. Potato	1.Small	02.50	01.36 (54.40)	01.36 (53.60)
	2.Medium	06.28	04.12 (65.61)	04.05 (64.49)
	3.Large	18.71	16.47 (88.03)	16.25 (86.85)
TOTAL		**27.49**	**21.95 (79.03)**	**21.64 (78.72)**
B. Tomato	1.Small	02.44	.02.33 (97.39)	02.21 (90.59)
	2.Medium	04.33	04.09 (94.46)	03.85 (86.92)
	3.Large	10.06	09.74 (96.82)	09.12 (90.66)
TOTAL		**16.83**	**16.16 (96.02)**	**15.18 (90.20)**
G. Cauliflower	1.Small	03.58	03.35 (93.57)	03.30 (92.18)
	2.Medium	05.59	05.33(95.35)	05.19 (92.84)
	3.Large	14.70	14.34(97.55)	13.95 (94.90)
TOTAL		**23.87**	**23.02 (96.44)**	**22.44 (94.01)**

Source: Primary data

(Figures in parenthesis are percentages to total Production)

The marketed surplus of the three vegetables is being sold to the consumers through different market channels. The farmers sold their marketed surplus through more than one channel. The distribution of quantities sold by different size groups of farmers in different channels of marketing is also analyzed in our study. Table-II below presents the distribution of marketed surplus of the sample vegetables in five identified marketing channels.

Determinants of Marketed Surplus

There are many factors which determine the marketed surplus of vegetables. The factors in the study were regressed to find the impact of each factor on marketed surplus of sampled vegetables (Table-II and III). All the variables were non-incorporated due to multi-collinearity problem. It can be observed from Table-II that the regression co-efficient for total production of potatoes is found to be positively related to the marketed surplus. It was found to be highly significant (at 1 %) in small and marginal sample farms, indicating that an increase of one quintal output will increase the marketed surplus by 53 and 72 Kg. in marginal and small farms respectively. The regression coefficient with respect to the family size (number of adults) was found to be negatively related as in case of gross income. The regression coefficients for total consumption were found to be negatively highly significant (at 1 %) and poorly significant (at 10%) in small and overall group of farms respectively. With respect to weighted price of potato, the regression co-efficient was found negative and non-significant in farm, and negatively highly significant in overall size of farms.

Table-II: Regression Co-efficients and t-Values of Factors Affecting Marketed Surplus of Potato in Sample Farms

Size Group	Intercept	Family size in adult Units (X)1	size of Holding (X)2	Total production (X)3	Gross income in Rupees (X)4	Total Consum-ption (X)5	Price of the crop (X)7	R2	N
Small	0.1871			0.7204 (34.912)	-2.7150 (-2.427)	0.6174*** (4.542)		0.005	36
Medium	-0.1937	-0.0264***	5.7130***		-4.6250			0.995	22
Large	0.1400			0.1548 (1.6130)	5.4880 (-1.0877)			0.948	18
All	-0.2687	-0.0041 (0.3603)	4.7363 (17.444)		-5.2050 (-1.5262)	0.5970* (-1.936) J	-0.003 (-3.727)	0.942	76

*** *Significant at 01 percent level of significance.*
** *Significant at 05 per cent level of significance.*
* *Significant at 10 per cent level of significance*

Table-III: Regression Co-efficients and t-Values of Factors Affecting Marketed Surplus of Tomato in Sample Farms

Size group	Intercept	Family size in adult Units (X$_1$)	Total production (X$_3$)	Gross income in Rupees (X$_4$)	R^2	N
Small	-1.0075	-0.0211** (-3.684)	1.0014*** (16.325)	-7.5400*** (-3.595)	0.948	34
Medium	-0.1117	-0.0198 (-0.6091)	0.9447*** (31.358)	-	0.989	21
Large	-0.3657	-0.0325** (-4.3148)	1.0111 (63.888)	-	0.99	11
All	0.0195	-0.0006 (-0.895)	0.9546*** (45.894)	-	0.982	65

*** Significant at 01 percent level of significance.
** Significant at 05 per cent level of significance.
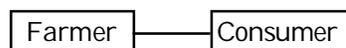* Significant at 10 per cent level of significance.

The regression co-efficient of the total production in tomato (Table-III) was found significant with respect to family size, it was found negatively significant in small and large farms, whereas gross income of marginal farm was found negatively related to marketed surplus.

Thus, we observe that total production plays an important role in the marketed surplus but the variables-family size, gross income, total consumption, and non-market transaction are also observed to affect the marketed surplus in desired direction at different levels of significance. Increase in area under cultivation of the crop has significant impact on marketed surplus. Unexpectedly, we found that the farmers were not found price responsive. This may be attributed to the fact that the farmers are bound to sell their products at low price just after the harvest under poor economic conditions.
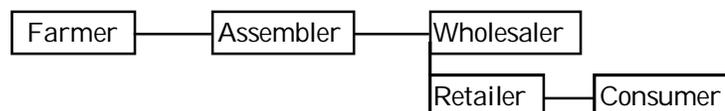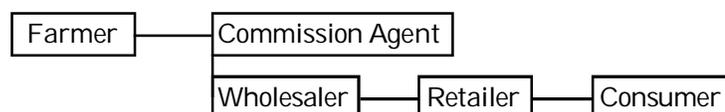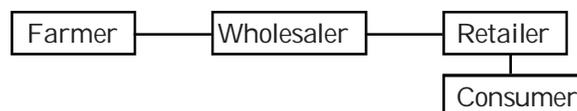
Marketed Surplus & Marketing Channels

Farmers sold their marketed surplus of vegetables through different marketing channels. Five marketing channels were identified in the study area. The following channels were utilized by the sampled farmers for selling their marketed surplus.

CHANNEL – I

Farmer ———— Consumer

CHANNEL – II

Farmer ———— Retailer ———— Consumer

CHANNEL - III

Farmer — Assembler — Wholesaler
Retailer — Consumer

CHANNEL - IV

Farmer — Commission Agent
Wholesaler — Retailer — Consumer

CHANNEL – V

Farmer — Wholesaler — Retailer
Consumer

There are so many factors, which influence the selection of different channels by the farmers, and one such factor is the quantity of marketable surplus with the farmers. Thus, it is desirable to analyze the marketable surplus and its distribution in different marketing channels.

It is also desirable to analyze how the farmers distribute their marketable surplus in different market channels. Actually, the farmers adopt different marketing channels not only for convenience but to extract higher net price. Table-IV shows the distribution of sampled vegetables by the farmers in different marketing channels

Table-IV: Marketed Surplus of Selected Vegetables Sold in Different Marketing Channels (In % age)

Vegetable	Marketing Channel	Small	Medium	Large	Overall
1. **Potato**	I	18.56	11.63	04.41	04.36
	II	62.11	30.65	03.35	03.27
	III	05.13	42.34	43.27	38.18
	IV	14.10	15.52	33.18	37.35
	V	-	-	06.36	16.74
2. **Tomato**	I	41.16	20.36	**05.21**	10.28
	II	25.42	21.18	16.03	18.64
	III	27.57	**33**.13	**38.28**	44.74
	IV	05.85	16.**59**	**21.64**	18.03
	V	-	08.**74**	**18.74**	08.31
3. **Cauliflower**	I	68.34	42.**82**	**12.48**	20.36
	II	14.56	16.**36**	**06.35**	21.13
	III	11.83	**17.08**	**36.71**	36.18
	IV	05.27	**15.41**	**27.69**	13.54
	V	-	**08.33**	16.77	08.79

Source: Primary data

It can be observed from the table that the farmers in general sell their potato through the first four marketing channels, and only 16.74% of the produce of the large farmers is sold through the fifth channel. It has been observed that a majority of small farmers (62.11 %) select the IInd channel to sell directly to the retailers at the *haat*. But overall, channel-HI is the most popular channel. Majority of sampled farmers sell their vegetable produce (43.27% potato, 44.74% tomato and 36.18% of cauliflower) in this channel. So, farmers prefer to sell their marketable surplus to assemblers at *Haat*.

However, it is interesting to see that in case of tomato and cauliflower the majority of small farmers prefer to sell their products in channel I where they sell it directly to the consumer. It was informed that in these vegetables, they get a higher margin for this surplus than potato, which is comparatively less perishable. Distribution of vegetable produce to different market channels depends upon the lot of sale. If the quantity for sale is more, they prefer channels other than 1st and 2nd. If the quantity for sales is less, the farmers prefer to sell the produce directly to the consumer.

Marketing Cost of Vegetable

The vegetables are sold by farmers through agents and those who are non–members. The information relating to per quintal cost of marketing of vegetables is presented in *Table V.*

The results indicate that marketing costs varied from one vegetable to another. Of the several components of total marketing costs, transportation was a major cost. It constituted more than 37 per cent of the total marketing cost. Next in order of magnitude are commissions to commission-agent and the packaging charges, sharing nearly 33 per cent and 14 per cent of total costs of marketing respectively. The farmers sell their vegetables in different stages of markets.

Table – V: Marketing Cost of Vegetable of the Sample Farmers (Per Quintal)

S.N	Vegetable	Grading	Packaging	Transportation	Commission of Agent	Commission of Society	Ground Rent	Halting Charge	Wastage	Weighting Charge	Total Marketing Cost
1	Potato	2.86	15.32	55.55	45.40	14.18	3.75	1.25	0.21	1.00	139.52
2	Tomato	3.59	31.11	51.88	51.88	16.21	3.75	1.25	0.50	1.00	161.07
3	Cauliflower	3.11	15.79	36.67	49.18	15.37	3.75	1.25	0.67	1.00	146.79

(Figures in parentheses are percentage to average total cost)

Net Price Received for Sale of Vegetables

The average net price means the gross prices received minus the average per quintal cost incurred on marketing of these vegetables by the farmers. It was hypothesized that the net prices received by the farmers may vary according to place of sale. Average net price received was compared for Channel – II and channel – IV and the results are presented in Table – VI

Table –VI: Average Net Price Received for Vegetable

Sl.No.	Name of Vegetable	Channel – II…………..		Channel – IV	
		Av. Quantity marketed	Av. Price received	Av. Quantity marketed	Av. Price received
1	Potato	39.72	432.12	38.15	427.98
2	Tomato	40.44	490.50	40.04	487.42
3	Cauliflower	33.06	583.15	29.66	575.52

It may be seen from the table that the average prices received for each of the vegetables by the farmers who were adopting Channel – IV were marginally higher than their counterparts for sale in the same market. Cauliflower received the highest per quintal net price followed by tomato. Potato received the lowest per quintal net price in case of both the potato channels.

Marketing Efficiency

Marketing efficiency is the effectiveness of a marketing system. To compare the effectiveness of the marketing system, marketing efficiency index of the farmers who marketed their produce through channel – II and those who marketed through Channel – IV in different markets was also calculated and the same is presented in Table – VII

Table–VII Marketing Efficiency for marketing the vegetables in terminal markets for the farmers in channel II & IV

Sl.No.	Name of Vegetables	Marketing Efficiency Index	
		Channel II	Channel IV
1	Potato	427.51	406.75
2	Tomato	404.30	402.61
3	Cauliflower	393.07	388.22

It may be observed that for Channel IV sale of vegetables in different markets, marketing efficiency index was lower for all the vegetables than the farmers who sold the vegetables through Channel II in the same market. It may, therefore, be concluded that Channel II operated more efficiently than the Channel - II in marketing the vegetables of their member growers.

There are many problems faced by farmers. The farmers faced the problems of high market charges incurred by the middle men. Farmers also demanded proper storage facilities for vegetables, so the benefits of higher prices during lean period could be achieved. There were also complaints of high cost of insecticides and pesticides, lack of technical know-how regarding improved package of practices and the cultivation of vegetables. High cost of packing material was major problem faced by the farmers. Transport facilities were not a major constraint for most of the farmers carried the produce themselves.

Conclusion

It may be observed from the study that marketing of vegetables in Jharkhand involves different marketing channels consisting of growers, assemblers, commission agent, wholesalers and retailers. The vegetable growers sell their products immediately after harvest owing to the perishability of the product, lack of cold storage facility, poor economic condition of the farmers and other factors. They could have received a higher price for their product (potato) if sold at a future date. The factors such as size of holding and production have direct relationship with the marketed surplus of vegetables and their distribution in different marketing channels. However, factors like family size and gross income have a negative influence on marketed surplus of vegetables. The price has been found to have no impact on marketed surplus. This is due to the fact that the vegetable growers in Jharkhand are forced to sell the produce at whatever price is available to them. Due to low quantity of marketed surplus, economic compulsion to sell immediately, lack of storage, and other facilities, it is difficult for the farmers to sell the produce at future date.

The role of the government is creation of market access in the rural areas and to work for the improvement in the economic conditions of the farmers. The crux of the problems of the farmers of Jharkhand is thus, not only of development but also distributive justice which can be achieved only through those institutions such as co-operative societies which can strengthen linkages between production and marketing.

There is a need to restructure primary co-operative marketing societies, particularly from the point of view of betterment of economic standards of growers which solely depends upon remunerative farm production. The institutional approach to create adequate market access to the farmers can be best realized by strengthening co-operative societies. There has been greater emphasis on large centralized whole sale markets leading to the neglect of grassroot market institutions and functionaries. The result has been that small farmers cannot derive benefits of the market development programmes initiated by the

government owing to weak resource base. Setting-up of multi-purpose co-operative societies with both credit and marketing would be the most desirable strategy for strengthening co-operatives in the field of farm produce marketing. There have been direct and indirect government interventions in marketing of farm produce and for agrarian market reform in our country.

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