



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(12): 391-394
© 2018 TPI
www.thepharmajournal.com
Received: 25-10-2018
Accepted: 30-11-2018

Abhineet Ranjan
Shuats, Allahabad
Department of Agricultural
Economics, Uttar Pradesh, India

Jayant Zechariah
Shuats, Allahabad
Department of Agricultural
Economics, Uttar Pradesh, India

An economic analysis of postharvest losses and marketing of potato in Nawada district, Bihar

Abhineet Ranjan and Jayant Zechariah

Abstract

The study has examined the post-harvest losses and marketing of potato in Nawada district, Bihar. Multistage cluster sampling has been used for selection of 6 potato growers' villages, and 110 respondent farmers. The sample has also included 10 market functionaries. Potato has been selected for the study. The maximum aggregate post-harvest losses have been found at producer level followed by wholesaler and retailer. There was no organized market for potato. The marketing cost, marketing margin and price spread of potato was lowest in short marketing channel (Producer → Consumer) and highest in longest marketing channel (Producer → Pre harvest contractor → Wholesaler → Retailer → Consumer). The study has suggested that establishment of producer co-operatives to handle various activities relating to production and marketing of vegetables would help in reducing post-harvest losses. The study has suggested that establishment of producer co-operatives to handle various activities relating to production and marketing of vegetables would help in reducing post-harvest losses.

Keywords: post-harvest losses, marketing channels, potato, nawada

Introduction

Potato (*Solanum tuberosum* L.) popularly known as 'The king of vegetables', has emerged as fourth most important food crop in India after rice, wheat and maize. Indian vegetable basket is incomplete without Potato. Because, the dry matter, edible energy and edible protein content of potato makes it nutritionally superior vegetable as well as staple food not only in our country but also throughout the world. Now, it becomes as an essential part of breakfast, lunch and dinner worldwide. Being a short duration crop, it produces more quantity of dry matter, edible energy and edible protein in lesser duration of time than cereals like rice and wheat. Hence, potato may prove to be a useful tool to achieve the nutritional security of the nation. As being one of the principal cash crop, it gives handsome returns to the growers/farmers due to its wide market demand nationally and internationally for different kinds of utilization. Further it has been reported by the International Food Policy Research Institute (IFPRI) and International Potato Centre (CIP), India is likely to have highest growth rate of potato production and productivity during 1993 to 2020. During the same period, demand for potato is expected to rise by 40 percent worldwide. This indicates that a picture about a clear opportunity to capture the huge domestic and international market of potato by producing quality potato and its products. India is the world's third largest potato producing country. During the past 60 years the potato crop has shown spectacular growth in area, production and productivity in India with increases over this period of 6.6, 18.51 and 2.80 times respectively (Pandey and Naik, 2009). Potato productivity in India (18.4 mt ha⁻¹) is slightly higher than the world average (16.6 mt ha⁻¹). However, it is much lower than many countries in Europe and America, such as The Netherlands (42.4 mt ha⁻¹), mainly because in India it is grown as a short duration crop. The estimated total production in India for 2009-2010 was around 34 million mt from 1.55 million ha. In India, the potato continues to be a remunerative crop benefiting from increasing access to irrigation and chemical inputs such as fertilizers, as well as from the continued expansion in post-harvest infrastructure such as of roads and cold storage facilities. More than 80 per cent of the potato crop is cultivated on the Indo-Gangetic plains during the winter season. The three major states of the country producing potatoes being Uttar Pradesh, West Bengal and Bihar which contribute almost 68 percent of the total area and 78 percent of production.

At present, Bihar ranks third after Uttar Pradesh and West Bengal in potato area and production among the different states of India. In Bihar, potato is grown on 0.32 million ha with an annual production of 5.74 million mt and a productivity of 17.78 mt ha⁻¹

Correspondence
Abhineet Ranjan
Shuats, Allahabad
Department of Agricultural
Economics, Uttar Pradesh, India

(Anonymous, 2007). Potato is grown in all 38 districts of Bihar, but the major producers are Nawada, Patna, Vaishali, Saran, Samastipur, Gopalganj, East and West Champaran, Muzaffarpur and Gaya, which account for 80% of the area. In terms of productivity, Nawada, Patna and Vaishali are the foremost districts. Bihar has always been of concern for policy planners because of its low potato productivity despite the fact that it is blessed with highly fertile land and good quality water resources.

Objectives of the study

Considering the economic importance of potato, the study was undertaken with following objectives:

1. To find out socio economic profile of potato growers in study area.
2. To assess the post-harvest losses of potato at different marketing stages in different farm size group.
3. To measure the marketing costs, margin and price spread in the marketing of potato through different marketing channels.
4. To identify the marketing problems and measure to minimize
5. Data has been collected both from farmers and marketing functionaries. Multistage sampling design is used for sampling procedure.

Materials and Method

Selection of district

The total number of districts in Bihar is 38. Among these Nawada district of Bihar was selected purposively for study. It is because Nawada district has a large area of under potato production and is world famous for the production of potato on commercial scale.

Selection of the Block

Out of the 20 Blocks in Nawada district, the kashichak block

1 Socio economic profile of potato growers in kashichak Block, Nawada.

Table 1: Details description of the cultivated Land holdings in different Size of Farms group: No. of Respondent =110 S M L = 60+30+20 =110 (Area in hectares)

Sr. No.	Particulars		Size of Farms Group			Sample Average
			Small	Medium	Large	
1.	Size of farms group (In numbers)		60	30	20	110
2.	Average size of cultivated holdings in hectare		0.90	1.36	2.60	1.33
3.	Land utilization in different crops					
I.	Kharif	1. Maize	0.17	0.24	0.34	0.22
		2. Paddy	0.30	0.51	1.40	0.55
		3. Sorghum	0.23	0.20	0.12	0.20
		4. Others	0.20	0.41	0.74	0.35
II.	Rabi	1. Potato	0.46	0.88	0.99	0.67
		2. Cauliflower	0.18	0.26	0.64	0.28
		3. Wheat	0.12	0.10	0.32	0.15
		4. Tomato	0.14	0.12	0.65	0.22
III.	Zaid	1. Cucumber	0.36	0.66	1.41	0.63
		2. Watermelon	0.31	0.49	0.45	0.38
		3. Green fodder	0.23	0.23	0.74	0.32
4.	Gross cropped area		2.70	4.08	7.80	4
5.	Cropping intensity		300	300	300	300.75

Table 1: Revealed that size of the farms group in numbers for small, medium and large size farms were 60, 30 and 20

was purposively selected on the basis of highest production and maximum number of potato growers.

Selection of villages

Out of total 62 villages, 6 villages were selected purposively where maximum number of farmer grows Potato.

Selection of farmers/growers

From selected villages, we were prepared a complete list of all potato growers. And we will divide them into three categories on the basis of their area under potato cultivation.

1. Small size group having less than 1 hectare of land.
2. Medium size group having in between 1-2 hectare of land.
3. Large size group having greater than 2 hectare of land.

Then 10% of farm holder in all the three groups was selected randomly.

Results and discussion

The present study pertains to post harvest losses and marketing of potato in kashichak block of Nawada district. The data collected for this purpose were tabulated and analyzed.

The findings of the investigation have been presented under the following objectives.

1. To find out socio economic profile of potato growers in study area.
2. To assess the post-harvest losses of potato at different marketing stages in different farm size group.
3. To estimate the marketing costs, margin and price spread in the marketing of potato through different marketing channels.
4. To identify the marketing problems and measure to minimize post-harvest losses.

respondents respectively. Altogether 110 respondents were selected for study. Average size of the cultivated holdings per

hectare for small size farms was 0.90 ha followed by 1.36ha for medium size farms and 2.60ha large size of farms group, which constituted on sample average of 1.33 ha. It could be seen that land utilization pattern in different crops. The crops sown in Rabi season in this area were potato, cauliflower, wheat and tomato. Among these potatoes occupied major area 0.46 ha by small size followed by 0.88 ha for medium size farms and 0.99 ha for large size of farms groups. The season which selected for study was *Rabi* season because potato occupies maximum area during the *Rabi*

season.

Gross cropped area for small, medium and large size of farms group was 2.70 ha followed by 4.08 ha and 7.80 ha respectively. This makes the sample average of 4 ha for different size of farms group. The cropping intensity is an indicator of the efficient use of land. Cropping intensity was same in all size farms group i.e. 300%. This makes the sample average for cropping intensity was 300.75% among different size of farms group.

Table 2: Details description of sample size of households/Families in different Size of Farms group: No. of Respondent =110 S M L = 60+30+20 =110

Sr. No.	Particulars	Size of Farms Group			Sample Average
		Small	Medium	Large	
1.	Average Size of farms families	6.50 (100.00)	7.00 (100.00)	7.50 (100.00)	6.81 (100.00)
2.	Male	3.80 (58.46)	4.20 (60.00)	4.50 (60.00)	4.03 (59.17)
	Female	2.70 (41.53)	2.80 (40.00)	3.0 (40.00)	2.78 (40.82)
3.	Age Composition				
a.	Below 15 years	1.3 (20.00)	1.34 (19.14)	1.2 (16.00)	1.29 (18.94)
b.	15-60 years	4.97 (76.46)	5.46 (78.00)	5.6 (74.66)	5.21 (76.50)
c.	60 years and above	0.23 (3.53)	0.20 (2.85)	0.70 (9.33)	0.30 (4.40)

Note: Figures in the parenthesis indicates percentage

The composition of an average size of the farm families according to sex and age composition was indicated in table 4.1.2. Average size of farm families in small medium and large size of farms group were 6.50, 7.00 and 7.50 respectively. The sample average percentage of male and female for different size of farms groups was 59.17 percent

and 40.82percent respectively. It could also be seen from the table age composition of different size of farms group. Highest sample average percentage of different size of farms belongs to the age composition of below 15-60 years (76.50%) followed by below 15 years (18.94%) and above 60 years and above (4.40%) respectively.

Table 3: Details description of Literacy in different Size of Farms group: No. of Respondent =110 S M L = 60+30+20 =110

Sr. No.	Particulars	Size of Farms Group			Sample Average
		Small	Medium	Large	
1.	Average Size of farms families	6.50 (100.00)	7.00 (100.00)	7.50 (100.00)	6.81 (100.00)
2.	Educational status				
i.	Primary	1.46 (23.17)	0.91 (13.00)	1.10 (14.66)	1.24 (18.20)
ii.	Middle High School	1.37 (21.07)	0.67 (9.57)	1.03 (13.73)	1.11 (16.29)
iii.	Intermediate	0.40 (6.15)	2.31 (33.00)	2.04 (27.20)	1.02 (14.97)
iv.	Graduation and above	0.56 (8.61)	0.73 (10.42)	1.21 (16.13)	0.72 (10.57)
2.	Total Literacy	3.79 (58.30)	4.62 (66.00)	5.38 (71.73)	4.30 (63.14)
3.	Total Illiteracy	2.71 (41.69)	2.38 (33.00)	2.12 (28.26)	2.51 (36.85)

Note: Figures in the parenthesis indicates percentage

Table 3 revealed that educational status of different size of the farms group. Literacy percentage was highest in large size farms (71.73%) followed by medium size farms (66.00%) and small size farms (58.30%) respectively. This makes the sample average for different size of farms group was 63.14%. Among small, medium and large size farms group the average sample were 14.97% who studied up to intermediate, 18.20% who studied the primary education, 16.29% who studied up to

middle high school and only10.57% of who studied up to graduation.

From the table it could be seen that illiteracy percentage was highest in small size farms (41.69%) followed by medium size farms (33.00%) and was lowest in large size farms (28.26%) respectively. sample average of illiteracy was 36.85% for different size of farms group.

Table 4: Details description of occupational distribution in different Size of Farms group: No. of Respondent =110 S M L = 60+30+20 =110

Sr. No.	Particulars	Size of Farms Group			Sample Average
		Small	Medium	Large	
1.	Size of farms group(In numbers)	60(100.00)	30 (100.00)	20 (100.00)	110 (100.00)
i.	One occupation (Primary occupation)	24 (40.00)	10 (33.33)	05 (25.00)	39 (35.45)
ii.	One occupation (secondary occupation)	20 (33.33)	11 (36.66)	07 (35.00)	38 (34.54)
iii.	One occupation (Tertiary occupation)	16 (26.66)	09 (30.00)	08 (40.00)	33 (30.00)

Note: Figures in the parenthesis indicates percentage.

Table 4: revealed that size of the farms group in numbers for small, medium and large size of farms were 60, 30 and 20 respondents respectively. Primary occupation was highest in

small size farms (40%) followed by medium size farms (33.33%) and lowest in case of large size farms (25%) respectively. This makes the sample average for primary

occupation was 35.45% for different farms size groups. Secondary occupation for small, medium and large size of Farms group was 33.33%, 36.66% and 35.00% respectively and the sample average for secondary occupation was 34.54% among different size of farms group. Tertiary occupation was highest in large size farms (40.00%) followed by medium size farms (30.00%) and lowest in small size farms (38.89%) respectively. This makes the sample average for tertiary occupation was 30.00% in different size of farms groups.

Conclusion

The study was on post-harvest losses and marketing of potato in Nawada district, Bihar. At producer level, the sample average of post-harvest losses in different farm group has been found maximum in harvesting (26.16%) followed by grading (18.87%), transportation (18.87%), storage (12.94%), packaging (12.82%) and minimum in marketing (1.31%). At the wholesale level, transportation has registered maximum in post-harvest losses (27.90%), followed by storage (20.93%), grading (18.60%), marketing (18.60%) and minimum in Packaging (13.95%). A retailer level also, transportation has registered maximum in post-harvest losses (26.66%) followed by storage (22.22%), grading (20.00%), marketing (17.77%) and minimum in packaging (13.33%). Across different stages, the losses have been found maximum at the grower level. The post-harvest loss of potato at the grower level results from lack of his knowledge about proper post-harvest management. Improper grading, packing, lack of storage and inadequate transportation facilities contribute more to the problem. One of the most important causes of postharvest losses is harvest at inappropriate maturity, resulting in erratic ripening and poor quality. Therefore, there is an urgent need of training the potato growers on scientific post-harvest techniques, if the potato production is to be sustained on a profitable basis in the region.

The marketing cost, marketing margin and price spread of potato under study was lowest in shortest marketing channel (Producer → Consumer) and highest in longest marketing channel (Producer → Pre Harvest contractor → Wholesaler → Retailer → Consumer).

In channel I, the marketing cost and price spread was Rs.75.50 per quintal and Rs. 75.50 per quintal respectively.

In channel II, the marketing cost, marketing margin and price spread was Rs. 114.63 per quintal, Rs. 66.79 per quintal and Rs.101 per quintal respectively.

In channel III, the marketing cost, marketing margin and price spread was Rs 160.45 per quintal, Rs. 144.26 per quintal and Rs. 304.71 per quintal respectively.

In channel IV, the marketing cost, marketing margin and price spread was Rs. 162.63 per quintal, Rs 234.47 per quintal and Rs.400 per quintal respectively.

The study has suggested that one possible solution to tackle these problems could be the establishment of producer co-operatives to handle various activities relating to production, and marketing of potato. This will not only help reduce the post-harvest losses but will also increase the bargaining power of growers in marketing. It will help them in adopting consumer-oriented approach to potato marketing.

References

1. Ajayi M Nawalieji. Production and Marketing of Vegetable, Indian Journal of Agricultural Marketing. 2010; 15(3):34-38.
2. Ali T. Reducing post-harvest losses of citrus fruits in

Pakistan through effective marketing practices: an overview. International Journal of Biology and Biotechnology. 2005; 2(4):801-805.

3. Buyukbay EO, Uzuno M, Bal HSG. Post-harvest losses in tomato and fresh bean production in Tokai province of Turkey. Scientific Research and Essays. 2011; 6(7):1656-1666.
4. Costa G, Caixeta F, Filho JV. Analysis of tomato marketing losses: a case study. Informacoes Economicas-Inslifulo Economia Agricola. 2002; 26(12):9-24.
5. Dileep BK, Grover RK, Rai KN. Contract farming in tomato: An economic analysis. Indian Journal of Agricultural Economics. 2011; 57(2):197-210.
6. Fulgence JM, Joan F, Musa S, Kushwaha S, Kift M, Mustafa J, *et al.* Consumer Preference for Quality Characteristics along the Cowpea Value Chain in Nigeria, Ghana and Mali. An international Journal of, Agri business. 2009; 25(1):16-35.
7. Gajanana TM. Marketing practices and post-harvest loss assessment of banana var Poovan in Tamil Nadu. Agricultural Economics Research Review. 2002; 15(1):56- 65.
8. Gajanana TM, Murthy DS, Sudha M, Dakshinamoorthy V. Marketing and estimation of post-harvest losses of tomato crop in Karnataka. Indian Journal of Agricultural Marketing. 2006; 20(1):1-7.
9. Gajbhiye DT, Kukade NN, Bagde NT, Burade AL. An economic analysis and postharvest losses of selected vegetables in Nagpur district, Maharashtra, Journal of Soil and Crops. 2008; 18(2):469-472.