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POST HARVEST LOSSES AND MARKETING TECHNOLOGIES OF AGRICULTURAL PRODUCTS IN KANPUR, UTTAR PRADESH, INDIA

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Abstract

The present study was conducted for the post harvest losses occurring in fruits, vegetables, food grains and oilseeds and marketing of farm produce in Kanpur district. This study was conducted to identify the major determinants of post harvest factors to reduce the losses and maximize the production. This research work was conducted in Ghatampur, Kalyanpur, Vidhnu, Bilhaur, Patara and Bhitargaon block using structured questionnaire. The main crops of Kanpur district were taken which were categorized among fruits, vegetables and food grains and vegetables. The various supports important for the area were for agri business, market development and sustainable agro market development. Among the studied blocks it was found that block Bilhaur and Kalyanpur has the maximum potential for the development of agribusiness. the post harvest losses, it was found that in fruits and food grains the post harvest losses has reduced when compared from 2016 to 2017 whereas it was reverse in case of vegetables. The losses were found to be more at farm level, storage level and processing level.

Keywords **:** Post harvest losses, Agriculture markets, Livelihood, Marketing technologies, Farmers

Introduction

The use of new technologies by the farmers such as HYV seeds, irrigation, pesticides, fungicides, fertilizers etc have made India a self-efficient in filling the tummies of the citizens. The livelihood of the people in the country depends directly or indirectly on the agriculture. The agribusiness leads to commercial agriculture by production, processing, storage and marketing of agricultural products. The agribusiness has been promoted by GOI under various schemes providing the boost in socio economic status of the farmers in India (Kumar, P., Dwivedi, P. (2018a), Kumar, P., Kumar S. *et al*. (2018b), Kumar, P., Misao, L., *et al*., 2018c, Kumar P, Dwivedi, P. 2018d, Kumar, P. and Purnima *et al*., 2018e, Kumar, P. Pathak, S. 2019f, Kumar, P. Siddique, A. *et al*., 2019g). All the agencies are lined up with the farmers and their association, farm producer-market linkages, profitable enterprises and agro based industries to provide technical as well as practical aspect to develop the skill, thus developing an effective agribusiness system in the country (Reardon, *et al*.,1999; Goletti, *et al*. 2001), (Kumar *et al*. 2018). The growth pertaining to agriculture will require value addition activities to generate the employment opportunities in the country (Siddique, A. Kumar, P. 2018h, Siddique, A., Kandpal, G., Kumar P. 2018i, Pathak, S., Kumar, P., P.K Mishra, M. Kumar, M. 2017j, Prakash, A., P. Kumar, 2017k., Kumar, P., Mandal, B., 2014L, Kumar, P., Mandal, B., Dwivedi P., 2014m., Kumar, P., Kumar, P.K., Singh, S. 2014n).

The quality of fresh fruits and vegetables cannot be improved after they are harvested, thus the harvesting time of these crops become more important. The harvesting of the crops will decide the quality and the quantity of post harvest losses. Thus they should be harvested at proper stage, form and size. Over mature or less mature produce have less self life and reduced storage life (Kumar, P. 2013o., Kumar, P., Dwivedi, P. 2015p, Gogia, N., Kumar, P., Singh, J., Rani, A. Sirohi, Kumar, P. 2014q, Kumar, P., 2014r. Kumar, P., Dwivedi, P., Singh, P., 2012s, Mishra, P.K., Maurya, B.R., Kumar, Pp. 2012t, Kumar, P., Mandal, B., Dwivedi, P. 2011u. Kumar, P., Mandal, B., Dwivedi, P. 2011v, Kumar, P., Pathak, S. 2016w, Pathak, S., Kumar, P., Mishra, P.K., Kumar, M. 2016x). The optimum harvesting will also lead to proper development of flavor and colour development during ripening. Those fruits and vegetables which are harvested early do not attain proper ripening. The farmers have their on way of judging maturity based on shape, size, smell, colour, texture, taste and resonance which may vary from crop to crop. The right harvesting time depends on the climatic conditions and time of harvest. The harvesting time is different for different crops. For most of the vegetables and fruits the proper harvesting time is either early in morning or late evening. The harvesting should be carried out at the coolest time of the day i.e either in morning or evening.

The harvesting leads to cleaning, sorting, checking, grading, packing and dispatching of the agricultural products. The storage of horticultural crops has become very important in relation to fresh production and distribution. The markets available in cities are fully accustomed to hold the large quantity of fruits and vegetables through modern storage techniques as compared to the rural areas. The lack of the storage facilities lead to greater post harvest losses. The produce at the time of harvest are in abundant which either leads it to be sold in less price or post harvest losses. The amount of losses will be depending upon the type of commodities, pre and post harvest practices and the climatic conditions. The total loss can be finalized by taking summation of all the losses occurred at each stage of marketing chain. There have been many studies which have worked out the losses at individual stage where as this research will put in focus on all the losses throughout the chain. Thus the main objective of this research is (i) To identify the major determents of post harvest factors and (ii) To determine the harvest need of farm produce for better marketing (Kumar, P., Harsavardhn, M. *et al*., 2018y. Kumar, P., Yumnam, J. *et al*., 2018z, Kumar, P., Pandey, A.K., *et al*., 2018aa. , Kumar, P., Kumar, S. *et al*., 2018bb, Kumar, P., Krishna, V., *et al*., 2018cc).

Methods and Materials

Study area- The study area consist of Ghatampur, Kalyanpur, Vidhnu, Bilhaur, Patara and Bhitargaon block for detailed study with the help of survey schedule.

Time period- The data has been conducted taking two years in consideration for comparing the various parameters .i.e. 2016 and 2017

Respondents- The respondents taken were the Agricultural Officers, Agri businessmen, public representive and farmers.

Crops- The crops taken were main crops of the district categorized into fruits, vegetables, food grains and oilseeds.

Research conduct-The present study was conducted by using interactive survey methods with intensive discussion held with the respondents. The SPSS has been used for further statistical analysis.

Result and Discussion

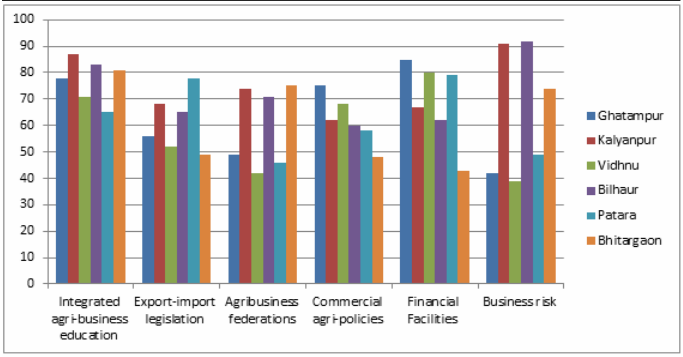
The findings of the study are given below

Important supports for Agribusiness, market and sustainable agro based market development

The above table 1 and graph 1 reveals the type of support required for agribusiness development. The most important support is integrated agribusiness education followed by financial fascilities, business risk mitigation insurance support with the least to be agribusiness federation. In comparison with the areas Kalyanpur followed by Bilhaur has most potential for the purpose where as Vidhnu has the lowest potential.

Table 1 : Supports important for the agribusiness development

Parameters	Ghatampur	Kalyanpur	Vidhnu	Bilhaur	Patara	Bhitargaon	Mean
Integrated agri-business education	78	87	71	83	65	81	77.50
Export-import legislation	56	68	52	65	78	49	61.33
Agribusiness federations	49	74	42	71	46	75	59.50
Commercial agri-policies	75	62	68	60	58	48	61.83
Financial Facilities	85	67	80	62	79	43	69.33
Business risk mitigation insurance support	42	91	39	92	49	74	64.50
Mean	64.17	74.83	58.67	72.17	62.50	61.67	



The table 2 and graph 2 reveals the type of support for market development. The most important support is homestead storage followed by product chain values and banking instant loan with lowest support of localized processing. In comparison with the block of the city Bilhaur and Kalyanpur have the highest potential for the purpose.

Table 3 and graph 3 shows the type of support for sustainable Agro-Market development is highest for Agribusiness education whereas least is with the Agri standard commodity legislation. Bilhaur and Kalyanpur block have the most potential for the purpose.

Cumulative losses at various levels in fruits, vegetables spices and flowers

Table 4 and Graph 4 reveals the post harvest losses occurring in fruits in the study area. It was seen that more losses were found in Banana followed by Mango, papaya and aonla where as minimum losses were reported in citrus. Talking about the losses during different stages of post harvest it was found that maximum losses were in farm level, processing level and consumer levels. This suggest more structural changes are required at farm, storage and processing level

Table 2 : Types of support for market development

Parameters	Ghatampur	Kalyanpur	Vidhnu	Bilhaur	Patara	Bhitargaon	Mean
Homestead storage	85	87	63	92	67	63	76.17
Product chain values	72	81	53	88	58	53	67.50
Banking instant loan	71	57	66	62	62	76	65.67
Costing and pricing	52	61	56	87	46	56	59.67
Localized processing	31	52	39	93	49	49	52.17
Market	57	62	52	48	62	42	53.83

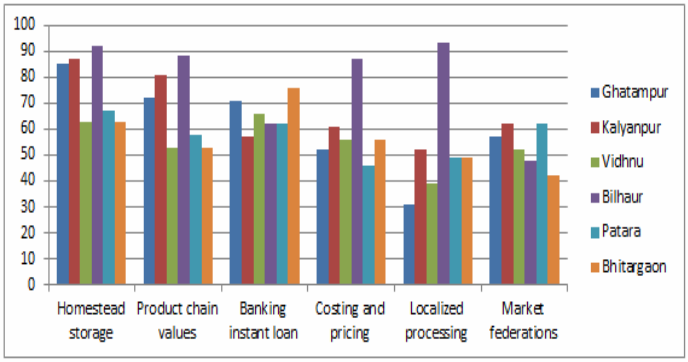


Table 3 : Types of supports important for sustainable agro-market development

Parameters	Ghatampur	Kalyanpur	Vidhnu	Bilhaur	Patara	Bhitargaon	Mean
Agri-business education	51	87	62	83	52	55	65.00
Agri-business training	68	71	58	93	48	48	64.33
Agri-business Cooperatives	75	57	52	66	58	52	60.00
Agri standard commodity legislation	47	51	37	56	47	46	47.33
Farmer and human right recognition	37	52	43	79	41	45	49.50
Gender neutral farming system	38	42	58	72	52	57	53.17
Mean	52.67	60.00	51.67	74.83	49.67	50.50	

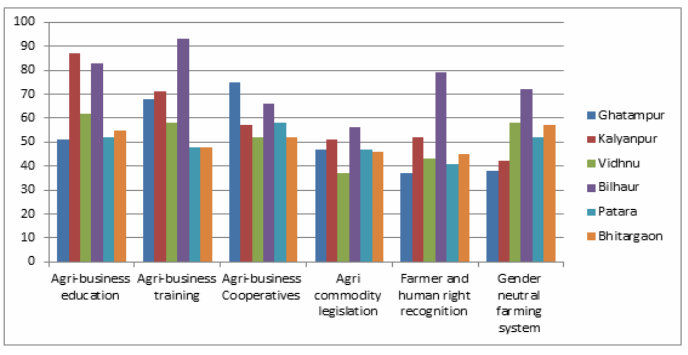
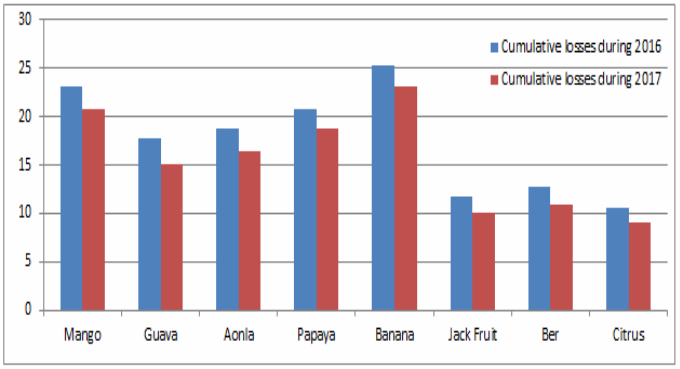


Table 4 : Cumulative losses at various levels in fruits

Fruit	Percent cumulative losses											
	Farm level		Market level		Storage level		Processing level		Consumer level		Total cumulative	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Mango	8.4	8.1	2.7	2.2	5.2	4.7	4.9	4.3	1.9	1.5	23.1	20.8
Guava	5.6	5.2	2.2	1.5	4.3	3.7	3.9	3.5	1.7	1.2	17.7	15.1
Aonla	6.5	6.1	3.5	3.1	3.5	3.1	3.2	2.6	2.1	1.5	18.8	16.4
Papaya	7.2	6.9	2.5	2.2	4.6	4.2	4.1	3.5	2.3	1.9	20.7	18.7
Banana	8.1	8.3	2.6	2.1	6.5	5.9	6.2	5.6	1.8	1.2	25.2	23.1
Jack Fruit	3.5	3.5	1.6	1.4	2.9	2.5	2.6	2.1	1.2	0.5	11.8	10.0
Ber	3.9	3.7	1.9	1.5	3.2	2.8	2.6	2.3	1.1	0.6	12.7	10.9
Citrus	4.2	4.0	2.3	2.1	1.9	1.6	1.2	0.9	1.0	0.5	10.6	9.1



The table 5 and graph 5 shows that the post harvest losses were found more in 2017 as compared to 2016 in vegetables whereas the same has reduced in fruits and foodgrains. It was found tht the maximum losses were reported in tomato followed by brinjal,cauliflower and cabbage where as minimum was found to be in carrot. The post harvest losses were more during farm level, storage level and processing level.

Table 5 : Cumulative losses at various levels in vegetables

Vegetables	Percent cumulative losses											
	Farm level		Market level		Storage level		Processing level		Consumer level		Total cumulative	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Chilli	1.2	1.5	1.0	1.2	1.5	1.7	1.4	1.6	0.8	1.0	5.9	7
Okra	1.4	1.8	1.1	1.3	1.7	1.8	1.6	1.8	0.7	1.0	6.5	7.7
Tomato	2.5	2.9	2.1	2.5	2.8	3.0	2.5	2.8	1.1	1.3	11	12.5
Brinjal	2.3	2.5	1.5	1.8	2.5	2.7	2.2	2.5	0.5	0.6	9.0	10.1
Cauliflower	1.9	2.1	1.4	1.6	2.3	2.8	2.0	2.2	0.8	0.9	8.4	9.6
Cabbage	1.5	1.9	1.1	1.5	1.8	2.1	1.5	1.7	0.9	1.1	6.8	8.3
Spinach	1.4	1.6	1.2	1.6	1.6	1.8	1.5	1.6	1.1	1.2	6.8	7.8
Melon	0.6	0.9	0.4	0.5	0.9	1.2	0.8	0.9	0.5	0.6	3.2	4.1
Radish	0.8	1.2	0.4	0.6	1.1	1.3	0.8	1.1	1.0	1.2	4.1	5.4
Carrot	0.5	0.9	0.2	0.3	0.9	1.1	0.8	0.9	0.5	0.6	2.9	3.8
Turnip	0.6	0.8	0.3	0.4	0.8	1.2	0.6	0.8	0.8	1.0	3.1	4.2
Cucurbits	0.8	1.2	0.3	0.4	1.1	1.2	0.9	1.1	0.6	0.9	3.7	4.8

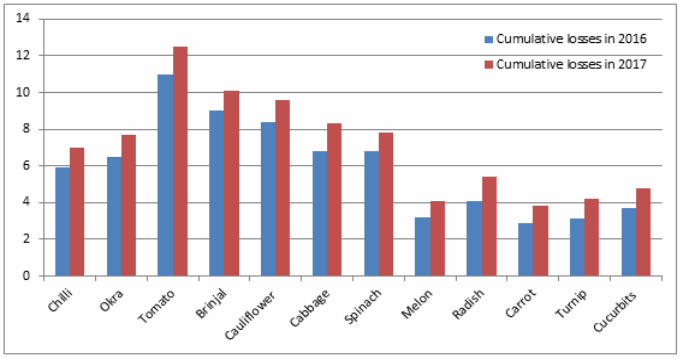
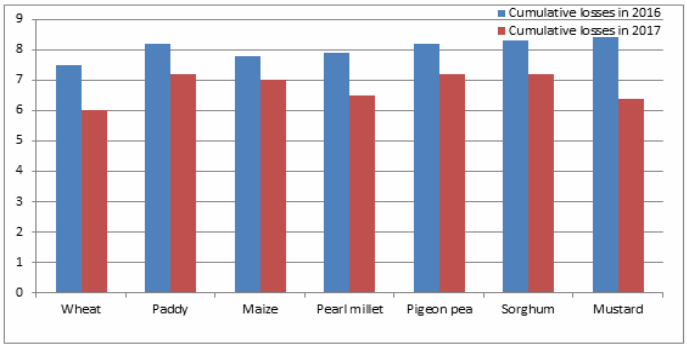


Table 6 : Cumulative losses at various levels in foodgrains and oilseeds

Foodgrains and oilseeds	Percent cumulative losses											
	Farm level		Market level		Storage level		Processing level		Consumer level		Total cumulative	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Wheat	2.3	2.1	1.2	1.1	1.9	1.2	0.9	0.7	1.2	0.9	7.5	6
Paddy	3.2	2.8	1.9	1.7	1.5	1.5	0.8	0.7	0.8	0.5	8.2	7.2
Maize	2.6	2.5	1.5	1.2	1.6	1.6	0.6	0.5	1.5	1.2	7.8	7.0
Pearl millet	2.8	2.3	1.6	1.3	1.4	1.4	0.9	0.7	1.2	0.8	7.9	6.5
Pigeon pea	2.9	2.7	1.8	1.6	1.9	1.8	0.7	0.6	0.9	0.5	8.2	7.2
Sorghum	3.1	2.8	1.9	1.9	1.8	1.6	0.8	0.5	0.7	0.4	8.3	7.2
Mustard	3.0	2.8	1.8	1.2	1.9	1.5	0.9	0.3	0.8	0.6	8.4	6.4

Table and Graph 6 interpretate that the post harvest losses were least as compared to vegetables and fruits. It was due to the reason that the food grains have more self life as compared to others. In comparison to the foodgrains and oilseed the maximum losses were found to be in paddy, sorghum and pigeon pea where as minimum in wheat. The same trend was found regarding the losses was farm level, storage level and processing level.



Conclusion

The following research was conducted in the six blocks of Kanpur district in Uttar Pradesh i.e Ghatampur, Kalyanpur, Vidhnu, Bilhaur, Patara and Bhitargaon during the period of 2016-17. The survey was conducted with the help of survey schedule and secondary data collected from different government agencies. The main crops of Kanpur district were taken which were categorized among fruits, vegetables and food grains and vegetables. The various supports important for the area were for agri business, market development and sustainable agro market development. Among the studied blocks it was found that block Bilhaur and Kalyanpur has the maximum potential for the development of agribusiness.

While India has a huge range of biodiversity due to which a specific agribusiness policy by the government needed to be customized based on the area specific. The Government of India must look after agribusiness as a part of policies that have the specific relevance to its development including National Agricultural Policy, export-import policies etc. The import and export of commodities should be tax free to provide more incentive to the sector. The agribusiness development gives emphasis on regulatory environment, establishing Agro-processing zones and development of agro-technologies to ensure the income generation. Media should be given priorities to increase the advertisement on technologies suitable for small scale agribusiness.

Taking about the post harvest losses, it was found that in fruits and food grains the post harvest losses has reduced when compared from 2016 to 2017 whereas it was reverse in case of vegetables. The losses were found to be more at farm level, storage level and processing level.

As the post harvest losses were found to be maximum at farm level, storage level and processing level, this could be decreased as a part of increasing food production to feed the upcoming population. These losses shows lack of basic knowledge and facilities at various levels. Government should conduct various training to the stake holders at farm level, storage level and processing level. These trainings and workshop will educate the farmers, processing units and storing units to reduce the post harvest losses.

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