POST HARVEST LOSSES IN TOMATO IN TALASH TEHSIL TIMERGARAH DISTRICT DIR LOWER

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Abstract: In this study post- harvest losses of tomato in Talash, Tehsil Timergarah, District Dir Lower is assessed. The characteristic of farmers is investigated. The factors contribute to such losses are investigated. Regression model is used to assess the significant factors responsible for post- harvest losses in the study area. The result of the model shows that accesses to extension service, contact with fellow farmers, income of the farmer, distance to market, packing of produce, and skilled labore are the significant factors associated with post- harvest losses in tomato. In order to reduce the such losses, the responsible factors should be controlled by farmers and government.

Keywords: post-harvest losses, regression model, associated factors, distance to market, packing of produce.

Introduction

Post-harvest losses of fresh produce are more in developing countries than developed countries. According to Maiti et al. (2018) in developed countries 2-20% of fresh produce lost after harvest while in developing countries these losses are very higher i.e from 24% to 40%. In another study Elike et al. (2019) found that post-harvest losses particularly in fruits and vegetables are 50% which occur at different stages from harvesting to consumption. At harvesting these losses are up to 20%, followed by 8% at handling, 10% at processing and packaging, 10% at distribution and 5% at consumption or household level.

Worldwide tomato isproduces with steady and continuous growth, in the last decades of the twentieth century. Total tomato production was over 154 million tons in 2009 and 174 million tons in 2015. Pakistan is 37th largest producer of tomato in the world. China being top ten producer of the tomato, is the leading producer with 31.47 % global production and 53% of the tomatoes produced in Asia (Qasim et al., 2018).Post-harvest losses of horticulture is a problem existing in each country. But the reasons of these losses are different from country to country up to great extent. Rehman et al, (2007) study the losses of tomato after harvesting in Peshawar valley, Khyber Pakhunkhwa. They found some caused for such losses; not availability of cold storages, packing, poor marketing, and transportation. Twenty percent of the produce lost after harvest in this area. EI (2004) assessed causes of post- harvest losses in tomato, which are; diseases, defects mechanical injury, inadequate harvesting, lack of suitable packing to protect the produce, handling

skills, bad transportation, not availability of storage system. Reducing post-harvest losses can reduce cost of production, increase framer's income, low price for consumer, low cost of trade and distribution etc (Phiri, 2010). In the present study causes of post-harvest losses in tomato in Talash, Tehsil Timergarah, District Dir Lower is investigated.

Methods and Material

The population of this study is tomato growers in Talash, Tehsil Timergarah, Khyber Pakhtunkhwa, Pakistan. Sample of fifty farmers are selected from the study area by simple random sampling method. A structure questionnaire is deigned. The data collected by face-to-face interview. The characteristic of farmers is presented in tables. For investigating the significant factors affecting the post-harvest losses in tomato, multiple linear regression model is used. The dependent variable is post-harvest losses of farmers in kilo gram (kg). The independent variables in the model are; accesses to extension service, contact with fellow farmers, income of the farmer, distance to market, packing of produce, and skilled labore.

Regression model

$$PHL = \beta_0 + \beta_1 EXTN + \beta_2 Y + \beta_3 CONF + \beta_4 DSM + \beta_5 TPKM + \beta_6 LBR + e$$

Where, PHL is Post harvest losses of tomato in the study area. It is dependent variable in the model and is quantitative, measures in Kilograms.

EXTN denotes access to extension/projects. This is qualitative predictor variable indicating the access of farmers to extension and projects related to farming and especially related to post harvest handling. We use this variable as dummy that is 1 if the farmers have access to extension/ projects, and 0 otherwise

Y stand for Income of the farmer. This is quantitative predictor variable reveled the income of the farmers in Pakistani Rupees.

CONF is used for contact with fellow farmers. This is also qualitative predictor variable. We used this variable as dummy that is, the variable contact with fellow member (C0NF) is 1 if the farmer has contact to other fellow growers for taking necessary information about post-harvest handling. And 0 if the farmer has no contact to fellow members.

DSM denotes distance to market from field. This variable is measured in kilometers (kg).

TPKM denotes type of packing material used (wooden crates). This is also qualitative dependent variable therefore dummy could be used for it that is 1 if the farmer used wooden crates and 0 for other material of packing like shoppers, bags and cotton etc.

 LBR denotes Type of labor used. This is also dummy variable, that is 1 if trained labor is used for post-harvest handling 0 if untrained labor is used for post-harvest handling. And e is error term.

Results and Discussion

The characteristic of tomato growers is presented in table 1 which shows that 30% of the farmers have access to extension service. The reasons are lack number of extension service in the area and the not have of interest of the employees of the extension service in their job.

The table further shows that 60% of farmers make contact to other fellow farmers. They get information about the market, transportation etc. sixty four percent of the former is using modern method of harvesting, and they use modern tools for harvesting purposes.

Moreover, Table 1 reveals that 20% farmers use trained labors for harvesting purposes. 54% of the farmers use the special bags for packing and the reaming 46% person used low standard of bags. The average income of the farmers are Rs.13188 and the average distance from field to market is 37.8 kilometers indicating that most of the former used local market for selling their produce.

Table# 1: Characteristics of Tomato Growers.

Farmers characteristics	Number of farmers	Percentage
Educated	27	54%
Access to extension service	15	30%
Contact to fellow farmers	30	60%
Modern harvesting method	32	64%
Trained labor	10	20%
Wooden crate for packing	27	54%

The result of multiple linear regression model is presented in table 2. The model shows, access to extension service, contact with fellows, income, distance to market, packing, and skilled labors are significantly associated with post-harvest losses in tomato. The distance to market is positive related while other factor is negatively related, as the coefficient of these factors indicated in table 2. The distance to market increase led to increasing post-harvest losses. While as the other factors increasing the post-harvest losses decreases.

Table 2. Result of the Multiple Linear Regression Model.

Modern	Beta	t	Sign.
Constant	557.840	16.741	.000
Extension	-70.879	-1.728	.091
Contact fellow	-164.988	-4.032	.000
Income	-.005	-2.896	.006
Distance	686	1.854	.070
Packing	-136.290	-2.912	.006
Skilled Labor	-241.714	-4.174	.000

Conclusion

The post-harvest losses were associated with access to extension service, contact with fellow, income, distance to market, packing, and skilled labors. Thus, controlling these factors led to reducing of post-harvest losses in tomato in study area. Government should increase the number of extension services in the area that farmer get more help in reducing post-harvest losses.

References

Rehman, M. U., Khan, N., & Jan, I. (2007). Post-harvest losses in tomato crop (A case of Peshawar Valley). *Sarhad Journal of Agriculture*, 23(4), 1297-1284

El Assi, M. N. (2004). Postharvest losses of tomatoes and eggplants produced for local markets in Jordan. J. King Saud University Agric. Sc, 17(1), 37-46.

Qasim, M., Farooq, W., & Akhtar, W. (2018). Preliminary report on the survey of tomato growers in Sindh. Punjab and Balochistan, 1-35

Phiri, A. (2010). Post-harvest Losses of Fruits and Vegetables in Zambia. In Technology on Reducing Post-harvest Losses and Maintaining Quality of Fruits and Vegetables Proceedings of 2010 AARDO Workshop.

Maiti, R., Thakur, A. K., Gupta, A., & Mandal, D. (2018). Postharvest management of agricultural produce. In Research trends in bio resource management and technology. American Academic Press, USA, 137-166.

Elik, A., Yanik, D. K., Istanbullu, Y., Guzelsoy, N. A., Yavuz, A., &Gogus, F. (2019). Strategies to reduce post-harvest losses for fruits and vegetables. International Journal of Scientific and Technological Research, 5(3), 29-39.