Original Research Article

Impact of COVID-19 Lockdown on Income of Apple Growers in Kashmir: An Empirical Analysis

Abstract

COVID-19 pandemic caused serious disruptions to all economic activities across the globe. Besides other sectors that were significantly affected, production and marketing of agricultural products particularly horticulture remained among the seriously hit. The purpose of this study is to assess the effect of COVID-19 pandemic on the farm income of apple growers in Kashmirand the measures implemented by the government to prevent its spread ~~on the farm income of apple growers in Kashmir~~. The study is based on primary data collected from farmers of the Southern districts of Kashmir valley by adopting convenience sampling. Structural equation modeling (SEM) was employed to analyze the data using SmartPLS. The study found that fear of Covid-19 and the lockdown strongly affected workforce availability, market prices and distribution channel management. However, the impact of the lockdown on apple production was found to be insignificant. The study also found that production, workforce availability, market prices and distribution channel management significantly influenced the income of apple growers ~~.~~and ~~T~~the reason being self-inhibition towards buying, unless extremely necessary. Moreover, the produce lying in the cold chains was sold at cheaper prices due to the unavailability of potential buyers and disturbance in the distribution system. The results of the study can help policymakers in taking preventive measures without sacrificing the livelihood of families associated with horticulture.

Keywords: Covid-19 Measures, Lockdown, Social Distancing, Horticulture, Farmer Income

Introduction

The economy of Jammu and Kashmir is primarily based on agriculture and services. Kashmir valley is known for its handicrafts and horticulture. Horticulture sector plays an important role in the state economy and is an important contributor to the state gross domestic product.

Horticulture sector contributes around 8% to 10% towards the state domestic product (Directorate of Horticulture, 2020). Traditionally, handicraft industry used to be the major source of employment. But over the period, horticulture sector emerged as the biggest source of income in the economy. Horticulture provides employment to around 33 lakh people and around 7 la~~c~~kh families are directly or indirectly linked to horticulture(Directorate of Horticulture, 2020).Major horticulture crops from Jammu and Kashmir include apples, pears,saffron, plums, cherries and walnuts.Apple is the major crop of Kashmir valley. About 70% of the land under major fruit crops of Kashmir valley is ~~covered~~ under~~the~~apple cultivation and around two~~2~~ million metric tonsof apples are produced in Kashmir valley annually (Directorate of Horticulture, 2020).

COVID-19 pandemic caused serious disruptions to all economic activities across the globe. Besides other sectors that were significantly affected, the production and marketing of agricultural products particularly horticulture remained among the seriously hit (Richards, 2020; Tougeron, 2021). To prevent the spread of COVID-19,the government of Jammu and Kashmir ~~has~~ imposed lockdown in the state for months, which seriously affected the movement of people and commodities including horticulture produce. In light of these facts, the study is an attemptto assess the impact of COVID-19 paendea~~a~~micon apple production, workforce availability, market prices and distribution channelsand the measures implemented by the government to prevent its spread. ~~on apple production, workforce availability, market prices and distribution channels~~. The study further attempts to assess the impact of all these factors on the income of apple growers in Kashmir.

Conceptual Framework

The study used the~~below mentioned~~ conceptual model presented in (~~F~~igure 1~~)~~ as a tool to analyze different relations between COVID-19 preventive measures and Farm Income. The model draws possible relations between independent and dependent variables in a logical sequence. The study attempts to describe the influence of COVID-19 preventive measures on apple production, workforce availability, market price, distribution channel management and ultimately on farm income.

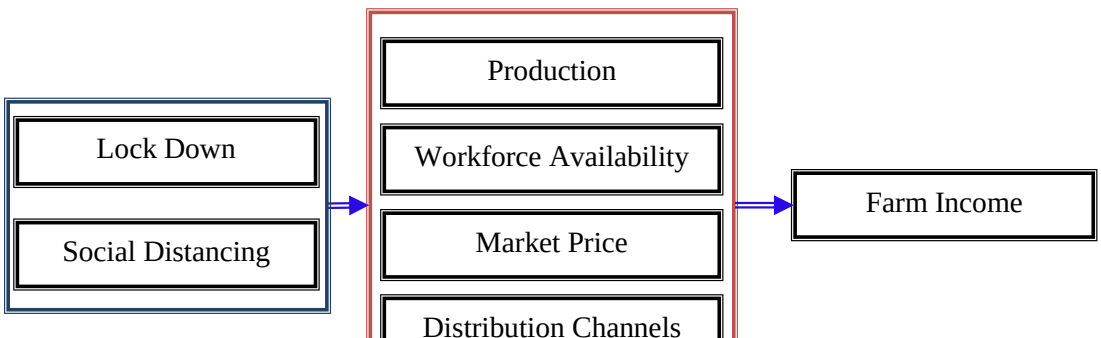

Figure 1: Conceptual Model

Hypothesis

In light of the above conceptual model, the following hypothesei~~s~~ were formulated for testing:~~.~~

H1: COVID-19 lockdown has significant impact on apple production.

H2:COVID-19 lockdown has significant impact on workforce availability.

H3: COVID-19 lockdown has significant impact on Market price of apple produce.

H4: COVID-19 lockdown has significant impact on distribution channel management.

H5: Apple production has significant impact on the income of farmers.

H6: Workforce availability has significant impact on the income of farmers.

H7: Market price~~s~~ has significant impact on the income of farmers.

H8: Distribution channel management has significant impact on the income of farmers.

Methodology

The study is descriptive in nature and~~. The study~~ has adopted cross sectional research design to collect qualitative data from ~~the~~ apple growers of Kashmir. The data for the study was collected using a questionnaire at a single point of time.

Research Instrument

Development of research instrument is a crucial step for conducting a quality study. A quality research instrument helps to capture proper information from respondents and prevent

flawed results. The present study has adopted items from various previous studies to develop the questionnaire. Researchers suggests that previous literature should be consulted for instrument development as it improves the content and face validity of the instrument (Hair et al., 2006;Gentry and Kalliny, 2008). The questionnaire for the present study consists of 23 items measuring 6 constructs of the study. The questionnaire was subjected to pilot testing to confirm the viability of the instrument before conducting the final study. Table 1 presents the results of Factor loading, reliability and validity of the research instrument. The table depicts that the standard factor loading of all the items is above the threshold limit of 0.70 as suggested by Hair et al. (2006), therefore all the items were retained. Reliability of the instrument was established by examining the composite reliability (CR). Table 1 depicts that all the values of CR are above the threshold limit of 0.70 as suggested by Hair et al. (2019). Average variance extracted (AVE) was calculated to examine the validity of the instrument. Table 1 shows that the AVE of all the 6 constructs is above the threshold limit of 0.50 suggested by Hair et al. (2019)

Table 1: Factor Loading, Reliability and Validity

Constructs	Items	Std. Factor Loadings	AVE	CR
Lock Down	LOCD1	0.782	0.613	0.864
	LOCD2	0.766		
	LOCD3	0.753		
	LOCD4	0.829		
Production	PRDT1	0.725	0.576	0.844
	PRDT2	0.768		
	PRDT3	0.753		
	PRDT4	0.788		
Workforce Availability	WOAV1	0.882	0.733	0.891
	WOAV2	0.893		
	WOAV3	0.789		
Market Price	MKPR1	0.771	0.579	0.846
	MKPR2	0.746		
	MKPR3	0.733		
	MKPR4	0.792		
Distribution Channel Mgt	DSCM1	0.851	0.680	0.914
	DSCM2	0.825		

	DSCM3	0.801		
	DSCM4	0.799		
	DSCM5	0.846		
Farm Income	FRIN1	0.738	0.560	0.792
	FRIN2	0.779		
	FRIN3	0.726		

Source: SPSS Output

Table 2 presents the results of discriminant validity. The table depicts that the correlation coefficient between all the constructs is less than 0.85 as suggested by Kline (2005). Hence there was no issue with the discriminant validity.

Table 2: Discriminant Validity

Constructs	**LOCD**	**PRDT**	**WOAV**	**MKPR**	**DSCM**	**FRIN**
Lock Down (LOCD)	**0.783**					
Production (PRDT)	0.312	**0.759**				
Workforce Availability (WOAV)	0.348	0.393	**0.856**			
Market Price (MKPR)	0.227	0.282	0.23	**0.761**		
Distribution Channel Management (DSCM)	0.345	0.408	0.366	0.448	**0.825**	
Farm Income (FRIN)	0.291	0.582	0.43	0.475	0.596	**0.748**

Source: SPSS Output

Population and sampling

The study selected four~~4~~ southern districts (Shopian, Pulwama, Kulgam and Anantnag) of the Kashmir valley purposively. These districts contribute a major portion to the apple production of the valley. ~~5~~Five villages each were selected randomly from these districts. 50 orchardists from each village were administered a questionnaire. Out of 250 ~~Q~~questionnaires~~ers~~ administered, after accounting for missing responses, 238 responses were finally found suitable for analysis.

Data Collection and Analysis

The study is based on primary data which was ~~. Data was~~ collected using a pretested ~~Q~~questionaire~~er~~**.** Thequestionnaire for the study consisted~~s~~ of two sections. Section-I was

concerned with the demographic profile of respondents. Section-II consisteds of 23 questions/ statements measuring the variables of the study. The responses to the statements were captured using 5 points Likert scale. Structural equation modelling (SEM) was employed to analyse the data using SmartPLS.

Results and Discussion

Lockdown and Production

The study tried to analyse the production response of apples to COVID-19 induced disruptions in labour, fertilizer, and pesticide supply. The study found that there is no significant impact of COVID-19 disruptions on the production of Aapples. Table 3 presents the PLS-SEM results. The β coefficient for the relationship turns out to be0.072 and T-Value 1.021. However, the relationship was found insignificant at 5 percent significance level (p = 0.071). Hence H1 was rejected and it can be concluded that production of apples remained unaffected due to COVID 19 lockdown. Cullen (2020), Gray (2020) and Laborde et al. (2020) also found no significant impact of COVID -19 on production of various commodities.Further, Tougeron (2021) argued that no major food shortages have been reported from any part of the world during the previous years.

Lockdown and Workforce Availability

Apple industry is a labor-intensive industry and reliesheavily on workers for plantation, pest management, monitoring and harvesting (Tougeron, 2021). The study also found significant negative relationship between lockdown and workforce availability with β value = -0.326, T value = -3.571 and p value = 0.002. Hence H2 was supported at 0.05 significance level. Apple production in Kashmir is extremely dependent on workforce availability. Due to the non-availability of the local labour pool, the demand for labour is met by seasonal and migrant workers coming from other parts of India. The results revealed that due to the restrictions on the movement of people and the closure of state borders, Kashmir valley faced a severe shortage of labor which adversely affected apple industry in the valley.

Table 3: PLS-SEM Results

Hypotheses	Relationship	Coefficient	T Value	Sig.	Decision
H1	Lock Down → Production	0.072	1.021	0.071	Not Supported
H2	Lock Down → Workforce Availability	- 0.326	-3.571	0.002	Supported
H3	Lock Down → Market Price	-0.216	-2.962	0.024	Supported
H4	Lock Down → Distribution Channel Management	-0.373	-4.215	0.000	Supported
H5	Production → Farm Income	0.348	3.885	0.000	Supported
H6	Workforce Availability → Farm Income	0.263	2.362	0.000	Supported
H7	Market Price → Farm Income	0.299	3.087	0.000	Supported
H8	Distribution Channel → Farm Income	0.189	1.998	0.005	Supported
R Square		0.432			

Source: SmartPLS Output

Lockdown and Market Price

The study found that COVID-19 disruptions have a significant negative impact on the market price of apples. The relationship has β value = -0.216, T value = -2.962 and p value = 0.024. COVID-19 lockdown has dramatically impacted the fruit sales (Richards and Rickard 2020). During the pandemic, consumption habits have changed, and people have suddenly privileged safe consumption over origin, quality and other considerations (Eurofresh 2020). Also, the pandemic has taken a toll on the income of potential consumers. This led to a considerable fall in demand for the fruit which in turn resulted in a fall in market prices.

Lockdown and Distribution Channels

Majority of the apple produce of the valley is sold outside the state in Indian markets or foreign markets. The study assessed how COVID-19 related disruptions in transportation services have affected the distribution channels of the apple industry. The study found that COVID-19 has a significant negative impact on the distribution channels of apple the industry with β value = -0.373, T value = -4.215 and p value = 0.000. Hence H4 was supported.

Production, Workforce Availability, Market Price, Distribution Channel Management and Farm Income.

Table 3 presents the PLS-SEM results.The results in the table reveal that there is a significant positive relationship between production and farm income (β = 0.348, T value = 3.885 & p = 0.000), workforce availability and farm income (β = 0.263, T value = 2.362 & p = 0.000), market price and farm income (β = 0.299, T value = 3.087 & p = 0.000), and distribution channel management and farm income (β =0.189, T value = 1.998 & p = 0.005).In light of the above results, hypothesis H5, H6, H7 and H8 are supported at 0.05 significance level.

Conclusion

The study found that fear of Covid-19 and the lockdown strongly affected farmer income. The study found that COVID-19 lockdown has affected the apple industry of Kashmir in terms of availability of workforce, distribution and disturbances in the market pricesand. Tthe reason being self-inhibition towards buying unless extremely necessary. The lockdown has created hurdles in the distribution channels. Closure of national and international borders has prevented apple produce to reach national and international markets. thereby significantly decreasing the income of apple growers. Also, the freight charges skyrocketed during the period, taking a toll on the income of farmers.It was further found that the shortage of workforce has a significantly impacted the income of apple growers.Moreover, the produce lying in the cold chains was sold at cheaper prices due to the unavailability of potential buyers and disturbance in the distribution system. Although the government has taken many initiatives to ensure the produce is not wasted. Yet the stakeholders have faced various difficulties in selling their produce which resulted in a significant decrease in the income of farmers. The results of the study can help policymakers and horticulture experts in taking future preventive decisions without sacrificing the livelihood of families associated with horticulture particularly the apple industry.

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