

A study on the challenges in marketing in the Covid-19 affected economy by the black pepper growing farmers and recommendations with reference to Kerala

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Abstract. Unprecedented incidence of Covid 19, the global pandemic, made the marketing difficult for the spice growing farmers, especially for the black pepper farmers. Covid 19 has disrupted production, processing and marketing of black pepper at different points of the value chain. Since the spice industry is very labour intensive, it has got substantially due to lockdown followed by the Covid 19 incidence. It has affected the availability of labour, availability and proximity of the market place, share of produce sold through different marketing channels, quality and availability of agricultural inputs etc. These factors substantially affected the production and operational costs. This study has conducted among the black pepper farmers of different age, sex, income level, experience in farming, operational land holding etc. with in the geography of Kerala, a south Indian state where many of the farmers grow black pepper. This study is an attempt to investigate the challenges in marketing of black pepper by the farmers in Kerala after the incidence of Covid 19 pandemic. This study also provides recommendations to improve the marketing by overcoming different challenges raised after the incidence of the global pandemic, Covid-19.

1 Introduction

Black Pepper is known as the ‘King of Spices’ and its berries are used extensively as spices and also in the preparation of various ayurvedic medicines and nutraceuticals. Black pepper is grown in humid tropics where the average rainfall and humidity is high. In India black pepper is majorly cultivated in the plains and hilly tracts of South India, where Kerala contribute a major share in the area and production. Black pepper is consumed majorly by the house holds, various companies in the food industry and nutraceutical industry. Apart from the domestic consumption a fair share of pepper is exported to the foreign countries either as whole black pepper or as its value added products. However the recent dynamics in the market after Covid 19 impacted the pepper production and marketing. This study explores on various challenges in marketing faced by the farmers in Kerala who grow black

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pepper. This study has been conducted among sixty farmers who grow black pepper in different blocks of Kerala.

Black pepper has got different derivatives and mentioning the major derivatives below. These derivatives are being used for different purposes in the food and nutraceutical industry.

Black pepper is obtained from green unripe drupe of black pepper plant. The drupes are heated briefly in hot water, to clean and prepare them for drying. The heat-treated drupes are dried directly under the sun till the pepper skin around the seed shrinks and darkens into a black layer. It can be also done by sun drying the berries without boiling.

White pepper is produced by removal of the skin of the ripened berries. This is usually done by a process of retting. Fully ripened red pepper berries are soaked in water for about a week. By doing this the outer layer of the peppercorn decomposes. After rubbing the berries to remove the remains of the outer layer, the seed is dried. Removal of the outer layer of the seed can be accomplished through mechanical and chemical methods as well.

Green pepper is obtained from unripe drupes. Dried green peppercorns are treated so that it retains the green colour.

Red pepper is obtained from ripened drupes. Red peppercorns are treated so that it retains the red colour of the skin of the berries.

Crushed Pepper and Black Pepper Powder- Obtained by crushing or grinding the dried black pepper at different mesh size according to the requirements.

Black Pepper Oleoresins – They are the value added products obtained from black pepper using solvent extraction and have a lot of usages in the food and nutraceutical industry.

Black Pepper Essential Oils – Black pepper essential oils are obtained by distillation of black pepper by different extraction methods such as steam distillation, cold press extraction, CO₂ extraction etc...

Kerala has produced 20000 MT of black pepper from an area of 83770 Ha during 2019-20 and the estimated production during 2020-21 is 22000 MT from 83788 Ha* (Production: Trade estimate Area DASD).

In Kerala Pepper is predominantly grown in the districts of Wynad, Idukki, Kannur and Kasaragod Majority of the farmers cultivate pepper as a monocrop or as an intercrop in their farm holdings.

The incidence of Covid 19 made a substantial impact in the consumer needs and purchase behaviour of the consumers. It created a global economic downturn in many of the industries. Food industry also got affected badly after the incidence of Covid 19. Consumer behaviour shifts together with the unpredictable nature in production, disruption in the supply chain due to various reasons like lockdown and other restrictions etc...made marketing of products difficult. Many of the spice traders kept their inventory low due to the uncertainty during Covid 19. Investors and financial players were reluctant in the spice market globally due to the economic and business uncertainty after the Covid 19 incidence. In general, the farmers who grow black pepper sell their products through different marketing channels like 1) local traders 2) wholesale traders 3) middlemen 4) cooperative societies 5) Spice companies etc... Lock down, travel restrictions, availability of labourers, logistical bottlenecks etc... created hurdles in selling their produces by the black pepper growing farmers in Kerala. This study explores different factors in production, supply chain management, processing, value addition, communication and other factors which got affected due to Covid 19 incidence focusing the black pepper farmers of Kerala.

1.2 Review of literature

AKM Mohsin et al [1] in their study assess the impact of COVID-19 pandemic on the consumer economy. Consumer buying behaviour has been changed drastically due to various post Covid factors in the economy across the globe. The epidemic has impacted various industry including food industry in their business operations. The study reveals that gradually the farmers market will replace the super market chains as majority of consumers tend to reduce the number of purchases from the later. Valeria Borsellino et al [2] In their article emphasise on how Covid 19 drives consumer behaviour towards healthier and more sustainable partners in the food and agricultural markets. Post pandemic economy characterised by sinking market, short-term shrinking consumption and reduction in the consumer demand of the products played an important role in changing the consumer buying behaviour. Covid 19 pandemic has affected the food supply chain (FSC) and that eventually influences the eating habits and food choices of the consumers. In many of the places independent stores and small local stores were preferred over the supermarkets after the Covid pandemic and lockdown.

Kalle Hirvonen et al. [3] in their study explores on the food prices and the marketing margins during the Covid pandemic. This study explores about the rural and urban value chain of agriculture, changes in the agricultural marketing, value chain components including rural farmers, wholesale markets and retailers. Commodity prices can be reduced because of the factors like global recession and reduced demand, but there is a greater chance of increasing the commodity prices due to the changes in the purchase and storage patterns, low production and less supply. Marketing margins of most of the agricultural commodities have come down after the incidence of Covid 19 pandemic due to the potential inefficiencies that has happened in the food value chain that happened after the pandemic outbreak.

S S Sabu et al [4] in their article assess about the price behaviour of black pepper in the domestic as well as in the international markets. Since black pepper is a commodity it shows price volatility with low price and price spikes in a cyclical manner due to various parameters like volatility transmission from future markets to spot markets, hedging and illegitimate speculation etc apart from the seasonality of the crops, availability of warehouse systems etc. The instability in the price of black pepper has increased after post liberalization period and that reflects very much in the domestic market rather than the international market.

Saskia M van Ruth [5] in her studies, describes about various grades of black pepper and white pepper, about its storage and on how the equality deteriorates over time. Poor storage condition in many times lead to the potential loss of volatile component in black pepper and that creates hindrance to get good price for black pepper. The study assess on how a proper storage facility is important for maintaining the quality of black pepper and white pepper in the value chain.

1.3 Statement of the problem

Black pepper is the predominant spices that is being grown in Kerala. Marketing of black pepper has got affected in the pandemic affected economy. It affected in the cultivation, crop management, harvest and post harvest functions, storage and marketing. Sales of the commodity tends to be difficult during the pandemic time due to the non availability of the market place, proximity of the available market place, less availability of transportation, middlemen interference, fluctuating price of black pepper. All those created different challenges to the black pepper growing farmer community in Kerala. This study conducted among the black pepper growing farmers in Kerala to understand the challenges faced by

them and formulate strategies that could help them to overcome the challenges on a long term basis in the Covid 19 affected economy.

1.4 Objectives of the study

To assess the challenges faced by the farmers in marketing black pepper in the Covid 19 affected economy of Kerala.

To suggest strategies that could help the black pepper growing farmer community to overcome the marketing related challenges in the context of Covid 19 and beyond.

1.5 Scope of the study

Scope of the study is to find out the challenges in marketing of black pepper faced by the black pepper growing farmers in Kerala. The study has happened post pandemic among the black pepper growing farmers in different blocks of Kerala where black pepper is being cultivated.

2 Research methodology

Black pepper is majorly grown in the plains and hilly tracts of Kerala. Idukki and Wynad are the districts where black pepper is grown to the maximum. However, farmers are growing black pepper in the other districts as well. Primary data is collected by conducting a survey among sixty farmers who grow black pepper in different parts of Kerala.

The demographic survey has conducted by using simple random sampling method to select the pepper growing farmers. Those farmers include small, marginal, medium and large farmers who grow black pepper.

Secondary data is collected from various sources such as Spices Board of India, Department of Economics and Statistics, Department of Agricultural Development and Farmers welfare, different research articles, websites and current news [5-6].

Quantitative analysis using different statistical tools such as Paired T test, Measures of Association, Garrett Ranking etc are employed in this study to attain the best possible outcomes.

3 Findings

3.1 Basic Profile of the Survey Respondents

Response from sixty black pepper growing farmers from different blocks of Kerala is being collected for this study. The study is being carried out in all the fourteen districts and thirty-seven blocks. The study is being carried out in different demographic profile in different geographic area of Kerala. Below is the tabulation of the profile of the respondents among the pepper growing farmers who took part in this study.

Table 1. Basic profile of the survey respondents (sample size 60)

SL No	Variable	Category	Frequency	%
1	Age	<30	0	0.0
		31-40	17	28.3
		41-50	23	38.3
		51-60	12	20.0
		>60	8	13.3

2	Sex	Male	56	93.3
		Female	4	6.7
3	Education	Secondary and below	21	35.0
		Higher Secondary	17	28.3
		Graduation	15	25.0
		Post-graduation	7	11.7
4	Farming Experience	10 years and below	14	23.3
		11 to 20	27	45.0
		21-30	12	20.0
		31-40	7	11.7
		Above 40	0	0.0
5	Family size	4 and below	23	38.3
		5 to 6	32	53.3
		Above 6	5	8.3
6	Monthly farm income before COVID-19	<15000	17	28.3
		15,000-30,000	29	48.33
		30,000-50 000	5	8.33
		50,000-65,000	3	5
		>65,000	6	10
7	Operational land	<1 acre	8	13.3
		1-4 acres	40	66.67
		>4 acres	12	20

For this study sixty samples have been taken from the pepper growing farmers with different demographic profiles. Age, sex, education, farming experience, family size, monthly income and operational land holding were taken into consideration.

Two-way tables with measures of association between monthly income of sample farmers before and after COVID-19

Table 2. Frequency percentage two –way table of association- monthly income before and after COVID-19

Parameter	Category	Monthly income after COVID-19(Rs.)					Total
		<15000	15000-30000	30000-50000	50000-65000	>65000	
Monthly income before COVID-19 (Rs.)	<15000	16 (94.1%)	1 (5.8%)	0(0%)	0(0%)	0(0%)	17
	15000-30000	20 (68.9%)	9 (31.0%)	0(0%)	0(0%)	0(0%)	29
	30000-50000	0(0%)	1 (20%)	4 (80%)	0(0%)	0(0%)	5
	50000-65000	0(0%)	0(0%)	3 (100%)	0(0%)	0(0%)	3
	>65000	0(0%)	0(0%)	0(0%)	2 (33.3%)	4 (66.6%)	6
	Total	36	11	7	2	4	60

Ho – Monthly income of the black pepper growing farmers has increased after the incidence of Covid 19.

Pearson Chi2 (16) = 117.87 Pr= 0.000

Measures of association between the monthly income of black pepper growing farmers before and after Covid 19 has been done using two-way tables. Ninety-Four percentage of the farmers who were earning a monthly income of less than Rs.15000 remain unchanged even after the hit of Covid 19 pandemic. However, around six percentage of the farmers who were getting a monthly income of less than Rs 15000 has experienced an increase in the monthly income in the post Covid period and moved to the category of Rs 15000 to 30000. Similarly, in the category of farmers where the income range was Rs15000 to 30000 before Covid 19, sixty-nine percentage of the farmers got a reduced income and moved to the lower range of income category Rs. <15000 and the remaining thirty-one percentage of

the farmers stood in the same monthly income range of Rs. 15000-30000 after the incidence of Covid 19. In the monthly income category of range Rs. 30000-50000 eighty percentage of the farmers remain unchanged in their income post Covid. However, twenty percentage of the farmers faced a reduction in their monthly income after the incidence of Covid 19. It has not observed any changes in the monthly income after the hit of Covid 19, among the farmers who were earning a monthly income of Rs.50000 to 65000. Sixty-seven percentage of the farmers who were having a monthly income range of Rs.65000 and above before Covid 19 remain static at the same income level but thirty-three percentage of the farmers of that category faced a reduction in the monthly income after the incidence of Covid 19. This Pearson Chi square test has been done at sixteen degrees of freedom at one percentage significant level and which is statistically significant.

Change in area, production and price received by the farmers before and after COVID-19

Table 3. Paired t test on area, production, price and operational cost of black pepper before and after COVID-19

Variable	Before COVID-19	After COVID-19	Chage	SD	Pr (T>t)
Mean area under the crop (acre)	2.68	2.65	-0.034	0.36	0.23
Mean production under the crop (kg)	1337.5	1251.1	-86.4	375.6	0.04
Mean Farm gate price (Rs/kg)	326.8	390	63.2	38.2	0.00
Total Operation Cost (Rs/acre)	29032.3	32859	3826.7	1636	0.00

- Ho: 1) Mean area under black pepper has increased after Covid -19 incidence
 2) Mean production of black pepper has increased after Covid -19 incidence
 3) Mean farm gate price has decreased after Covid – 19 incidence
 4) Total operational cost has reduced after Covid -19 incidence

Mean production of black pepper has reduced from 1337.5 Kg per acre during the pre-Covid scenario to 1251.1 Kg per acre after the Covid-19 incidence at five percentage significant level. It has been observed that the mean area under the crop black pepper has reduced from 2.68 acre before Covid-19 pandemic incidence to 2.65 acre after Covid 19, though it is not statistically significant. The total operational cost per acre for cultivating black pepper has increased from Rs.29032.3 before the Covid-19 scenario to Rs 32859 after Covid 19 incidence at one percentage significant level. The mean farm gate price of black pepper before Covid-19 was Rs.326.8 and that has been increased to Rs.390 after Covid-19 incidence at one percentage significant level.

Two-way tables with measures of association between level of satisfaction on price received of sample farmers before and after COVID-19

Table 4. Frequency percentage two –way table of association- level of satisfaction on price before and after COVID-19

Parameter	Level of satisfaction on price received after COVID-19						Total
	Category	Highly satisfied	Satisfied	Neutral	Dissatisfied	Highly dissatisfied	
Level of satisfaction on price received before COVID-19	Highly satisfied	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1
	Satisfied	0 (0%)	14 (41.1%)	16 (47.1%)	3 (8.9%)	1 (2.9%)	34
	Neutral	0 (0%)	8 (40.0%)	8 (40.0%)	2 (10.0%)	2 (10.05)	20
	Dissatisfied	0 (0%)	0 (0%)	3 (60.0%)	2 (40.0%)	0 (0%)	5
	Highly dissatisfied	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
	Total	0	23	27	7	3	60

Ho - The level of satisfaction on price received by the black pepper growing farmers has increased after the incidence of Covid 19

Pearson Chi2 (9) = 9.26 Pr= 0.413

Measures of association between the level of satisfaction on price received by black pepper growing farmers before and after Covid 19 has been done using two-way tables. The level of satisfaction of the highly satisfied black pepper growing farmers regarding the pricing has moved down one level to ‘satisfied’. Forty one percentage of the farmers who were satisfied on the pricing before Covid 19 remained satisfied even after Covid-19 incidence whereas forty seven percentage of farmers moved one level down in the satisfaction level and opined neutral in the survey. Satisfaction level of nine percentage of the farmers shifted two level down to dissatisfied and of three percentage of the farmers moved four levels down to highly dissatisfied. Forty percentage of the farmers who were neutral in their opinion on the price satisfaction level before Covid 19 incidence have moved a level up to the satisfied after the Covid 19 incidence. Another forty percentage of the farmers remained static at the neutral level before and after Covid 19 incidence in their satisfaction level. Ten percentage of the farmers moved to the level dissatisfied and another ten percentage of the respondents moved to highly dissatisfied level after the incidence of Covid 19. From the satisfaction level of dissatisfied sixty percentage of the respondents moved one level up to the level ‘neutral’ after the incidence of Covid 19. However, forty percentage of the stood remain in the same level of satisfaction measurement even after the incidence of Covid 19. This study is at nine degrees of freedom which is significant at 41.3 percentage level. Though it is not statistically significant, the result has been included in this study.

GARRETT Ranking of constraints of black pepper growing farmers in marketing of produce.

Table 5. Garret ranking of constraints of black pepper marketing after COVID-19

Sl No	Constraint	Average Score	Rank
1	Availabilty of market space	80.5	1
2	Proximity of market space	69.1	2
3	Quality of Agricultural inputs	61.5	3
4	Timely market information	51.6	4
5	Middlemen interference	50.4	5
6	Necessity	47.7	6
7	Financing	45.3	7
8	Pricing / Rate	37.7	8
9	Storage facilities	29.4	9
10	Timely technical know how	26.9	10

The study has been conducted on various constraints that the black pepper growing farmers are facing during the Covid-19 situation. Farmers are finding the availability of the market place as the major constraint during the Covid 19 pandemic time and that is being ranked as one. The second major constraint is the proximity of the market place during the Covid 19 situation. Third major constraint that the farmers opined is the quality of the agricultural inputs such as the fertilizers, pesticides, pepper cuttings etc... during Covid 19 pandemic time. Farmers are facing hindrance on the timely market information during the pandemic and that has been ranked as the fourth major constraint. Middlemen involvement has increased during the Covid 19 pandemic and that has been ranked as five among the total of ten constraints. Covid 19 pandemic has necessitated distress sale at least with a few farmers and it has got a rank of six among the constraints. Financing for agriculture has been ranked as seven and the pricing during Covid 19 pandemic to the produce has been ranked as eighth. There was not much impact in the storage and timely technical knowhow during the Covid 19 pandemic time to the black pepper cultivating farmers and those constraints have got the rank of ninth and tenth respectively.

Average share of produce sold to different marketing channels by respondents before and after COVID-19

Table 6. Paired t test on black pepper sold through different marketing channels before and after COVID-19

Outlet for first sale	Before COVID-19		After COVID-19		Mean difference	Pr (Diff>0)
	Average share of produce sold (%)	SD	Average share of produce sold (%)	SD		
Local trader	77.2	30.3	67.1	17.9	-10.1	0.00
Middlemen/Agent	8.5	25	12.4	21.8	4.1	0.02
Co-operative Society	0	0	0	0	0	0
Company/Export firm	1.5	11.6	0.4	3.2	-1.08	0.16
Other	12.8	17.4	20.1	12.1	7.25	0.00
All	100		100			

Paired T test has been done to understand the changes in the average share of produce sold to different means of sales such as local trader, middleman or agent, co-operative societies, companies or export firms etc. Farmers were selling around seventy seven percentage of their total black pepper produced to the local traders before Covid 19. This has been reduced to sixty seven percentage with a mean difference of minus ten at one percentage significant level. However it is observed that the percentage of black pepper that has been sold to the middlemen or agent got increased with a mean difference of four at five percentage significant level. None of the respondents who participated in the survey sold black pepper to the cooperative society. Before Covid 19 incidence the respondents were selling around 1.5 percentage of their black pepper produces to the companies or export firms. After the Covid 19 incidence it is reduced to 04 percentage at sixteen percentage significant level which is not statistically significant. It is noted in this study that there is an increase of other channels of sales where the respondents were selling thirteen

percentage of black pepper produce before Covid 19 incidence. It has increased to twenty percentage after Covid 19 incidence at one percentage significant level. Below is the Error Bar Diagram showing the changes in the average share of black pepper produces sold to different sales channels by the respondents before and after the incidence of Covid 19.

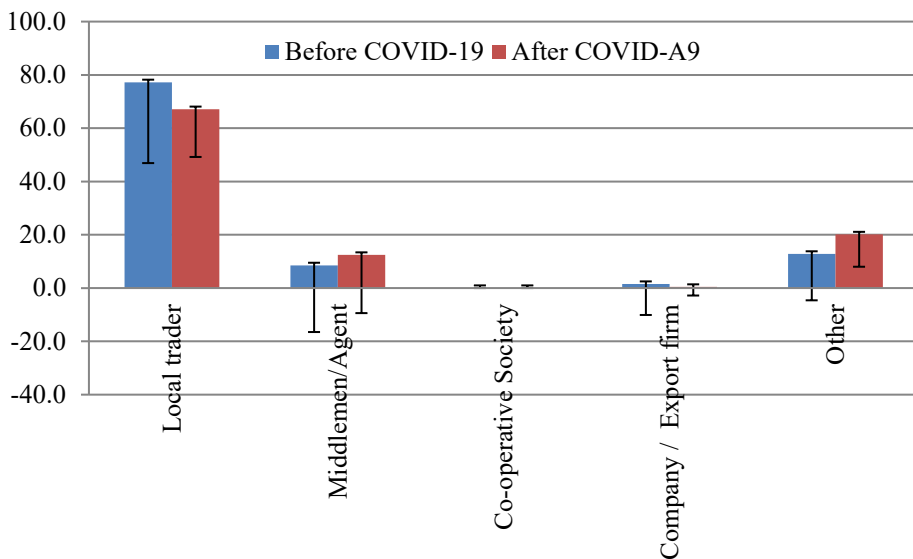


Fig 1. Error bar diagram on black pepper sold through different marketing channels before and after COVID-19

4 Suggestions

Marketing of spices produce like black pepper should be promoted through platforms like e-commerce that will provide an opportunity to the farmers to sell their products irrespective of the local market proximity. By diversifying the marketing channels black pepper growing farmers can spread their market and can reduce the price risks.

Majority of the pepper growing farmers are not doing any value addition of the product. This results in low price for the products and eventually a low farm income. Value addition increases the price and margin of the products.

Collection point for black pepper should be initiated at the Government level in every block so that the farmers will be able to sell their produce at the best price. This can also eliminate the middlemen involvement that has been increased during the Covid -19 incidence.

Farmers should practice wherever mechanization and new technologies possible to reduce the operational cost and there by an increase in the margin while selling.

Timely dissemination of market information will play a pivotal role in marketing of black pepper. This will enable the farmer to understand the trends in the price and sell their products accordingly in different markets to fetch a better price [7-10].

While comparing the average black pepper produce sold through different channels, black pepper sold to the companies are seemed to be very less. A proper relationship should be established between the small, marginal and medium farmers and the companies.

5 Conclusion

The study reveals that there is a significant impact in the marketing of black pepper after the incidence of Covid 19. The respondents were black pepper growing farmers of different age level gender, income, education, farming experience and farm holding size from different blocks of Kerala state in India where black pepper is being grown predominantly.

Majority of the farmers experienced lesser income from selling black pepper compared to the pre Covid 19 scenario. In this study it is observed that there is no significant reduction in the area of cultivation under black pepper before and after Covid 19 incidence. However, the production per farm holding has got reduced and the operational cost has got increased after the Covid 19 incidence. The operational cost has got increased due to the less availability of labour which was in plenty before Covid 19 incidence. Apart from this the input cost of fertilizers, pesticides, drying, cleaning, transportation etc got increased and marked a substantial increase in the production and operational cost. The unprecedented increase in the production and operational costs resulted in lower margin after the Covid 19 incidence compared to the pre Covid era.

After the Covid 19 incidence and unprecedented lock down the availability of the market place and transportation of the material to the nearest available market became difficult to the black pepper growing farmers [11-14].

Most of the transportation system and supply chain system has got affected very much so that farmers faced difficulties to get enough stock of agricultural inputs such as fertilizers and plant protection materials.

Because of the non-availability of nearest market place during the pandemic period, middlemen interference in the marketing channel became more active. It is observed that some of the farmers who sold their produce to the nearby people and a few of them tried the social media channels and e commerce platforms to sell their produce to the customers.

The study underlines that proper marketing strategies, efficient supply chain management, value addition of produce and timely market information are the need of the hour to face the challenges in marketing of black pepper and its value-added products in the Covid 19 and post Covid 19 scenario.

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