



Betel Vine Marketing in Tamil Nadu, India: Price Spread Analysis

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Tamil Nadu is one the leading betel leaf cultivating states in the country. Besides, it faces significant challenges in producing betel vines due to risk of pests and diseases. These risks have a negative impact on the farm economy. Disease outbreaks can be incredibly concerning and have an impact on a company's profitability. The higher labour costs, pest and disease and natural calamities have made it difficult for farmers to produce their crops. Therefore, it was essential to study the marketing cost, price spread and marketing efficiency of betel vine in Tamil Nadu. The use of a well-structured interview schedule allowed for the collection of information from farmers regarding the cost and return of producing betel vines. From the local marketplaces in Thanjavur District, village traders, commission agents, wholesalers and retailers were chosen. Price spread and marketing efficiency were used to know about the marketing cost and the price received by the farmer. The efficient marketing channel was channel III (Producer → Retailer → Consumer) because it has the lowest price spread of 18.9 per cent which be due to a smaller number of

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intermediaries. The marketing efficiency in channel III (16.1) was higher than in channel I (10.6) and channel II (6.3) respectively. Thus, marketing of betel leaf in channel III was more efficient for farmers.

Keywords: Marketing channel; marketing cost; price spread; betel vine; farmers share.

1. INTRODUCTION

Betel Vine is a valuable economic and heritage crop in our country. The scientific name for betel vine is (*Piper -betel Linn*). Betel farming activities can provide agricultural labourers with year-round employment, allowing them to sustain their livelihood. It is estimated that around 20 million people earn a living directly or indirectly from the production, processing, handling, shipping and marketing of betel leaves [1]. Betel vine is a perennial dioecious climber and believed to have originated in Central and Eastern Malaysia. It is mainly cultivated in South East Asian countries viz., India, Bangladesh, Sri Lanka, Malaysia, Thailand, Philippines etc., for its leaves, which is mainly used as stimulant.

In India, there are between 125 to 150 cultivars of betel vine, which is a significant cash crop. It was discovered that 20 million people in India get their living from the maintenance, plantation, administration, export and import of betel leaf. Cultivation of betel vine is done on around 55000 acres, with an annual production worth about Rs. 9000 million. It is mostly grown in Karnataka, Tamil Nadu, West Bengal and Assam, with an average production over the past seven years of 19.41 lakh leaves/ha. Being the second-largest producer of betel vines, Tamil Nadu faces significant challenges in producing betel vines due to risk of pests and diseases. These risks have a negative impact on the farm economy. Disease outbreaks can be incredibly concerning and have an impact on a company's profitability. The higher labour costs, pest and disease and natural calamities have made it difficult for farmers to produce their crops. Therefore, it is essential to study the marketing cost, price spread and marketing efficiency of betel vine in Tamil Nadu.

2. LITERATURE REVIEW

Lahiri [2] defined that one of the major cash crops in the Midnapur District was betel leaf. Its marketing is still restricted to the unorganised sector. Other than to provide collection, arrival and price information, government agencies have not intervened in the market. The quantity

of arrival of various betel vine varieties in various market kinds, marketing channels and market functionaries' price distribution of different varieties of betel are explained in this study. Das et al. [3] conducted a study in West Bengal produced 3.04 million crores of leaves annually on average. Out of which, around 80% was sold to foreign countries as well as sent to different regions of the nation. The Government has started a study on betel vine in the Midnapur district of West Bengal in light of the growing significance and lack of research on the economic aspects of betel leaf cultivation. Srivastava and Prasad [4] explained the development of more market intermediaries, which results in an excessive amount of gross marketing margins, is the primary cause of the difference between the prices paid by consumers and farmers, who earn prices that are relatively lower. The difference between the final consumer's price and the producer's price is known as the gross marketing margin. The marketing margin also serves as a measure of how effectively the marketing system is working. Pradhan and Rao [5] observed that the *Piper betel* is cultivated in soil that is black, friable and rich in organic matter, according to what it has observed. A hectare of land produces 18 million pan leaves annually; after the fifth year, the yield declines. After a rotation, vines must be picked four times a year after the leaves from a one-year plant are harvested. Varadarajan and Bose [6] determined the elements affecting the marketable excess, price spread and effectiveness of several marketing channels for betel leaf in Tamil Nadu Madurai area. There was a 98% marketable oversupply of betel leaf, it was discovered. For every additional acre under betel vine, the marketable surplus increased by 24.32 quintals. There were three main marketing channels identified and the producer-wholesaler-retailer-consumer channel was found to be the most effective one with a producer share of 78013 per cent and an efficiency index of 1.77 compared to 1.36 in the other channels, namely the channels involving commission agents and the channel involving village traders and commission agent. Sajjad et al. [7] conducted a study in Batkhela Tehsil of the Malakand district in the year 2004, this study aims to ascertain the

marketing channels of rice and the percentages of various marketing functionaries participating in those margins. Two marketing channels were found 1) Producer → Wholesalers → Retailer → Consumer 2) Producer → Beopari → Wholesaler → Retailer → Consumer. Producer obtained a 17.90% net margin and a 41.04% gross margin on channel 1. On channel 2, however, it was discovered that the producer earned a lower net margin of 36.36 per cent and a gross margin of 14.54 per cent. The primary cause of the decline in net margin and gross margin was found to be the farmer's relatively limited involvement in marketing operations. Additionally, it was noted that the primary marketing issues facing rice growers in the research area were a lack of cash, subpar extension services, expensive inputs and a dearth of marketing outlets. Other significant factors influencing marketing margin include total output, marketing intelligence, education, marketable surplus and marketing pricing. Thakare *et al.* [8] studied the economics of production and marketing of cowpea. They identify three marketing channels Channel I: Producers → Consumers Channel II: Producers → Retailer → Consumers. Channel III: Producers → Wholesaler → Retailer → Consumers. According to the study, farmers received the largest share of the price spread for cowpea marketing for channel I, accounting for 89.97% of the consumer price, followed by channels II and III at 74.95 and 69.19%, respectively. Channel I, with a marketing efficiency score of 8.97, outperformed Channel II (2.99) and Channel III in terms of effectiveness (2.24). The marketing efficiency in channel II and III was low due to higher marketing margin and marketing cost which resulted in inefficiency in the marketing of Cowpea. Hasan and Khalequzzaman [9] conducted a study in Garlic marketing four significant marketing channels were found. The main supply chain via which 40% of domestically produced garlic reaches consumers is Channel-3. Comparing retailers to other middlemen, their marketing margin and profit were the highest. Out of the four marketing channels, Channel 2 performed better than the others. There are six different actors involved in the operations of the garlic value chain: the farmer, the local merchant, the trader, the commission agent, the wholesaler, the retailer and the consumer. Retailers added the most value per unit of garlic, while wholesalers added the least. Bagde *et al.* [10] conducted a study in Anjangaon Surji, in the Amravati district, were chosen to study the price spread in betel leaves. The Shepherds method was used to calculate the marketing

effectiveness of the three channels. Channel I had a total marketing cost of \$30, whereas channels II and III had costs of C66 and C140.39, respectively. The overall marketing margin for channel II was C75.00, but it was C366.42 for channel III. Yesdhanulla and Aparna [11] and Vinayagamoorthi *et al.*, [12] observed that Indicators of marketing effectiveness and price spread analysis were developed for the two marketing channels. For channels I and II, the producer earned a net price of Rs. 725.95 and Rs. 717.80, respectively. The percentage share of the gross marketing margin in consumer rupees for channels I and II, respectively, was 29.85 per cent and 32.58 per cent. The total marketing costs in consumer rupees were 23.31 per cent and 27.53 per cent. Channel-I had the highest producer share in consumer rupee (46.84%) and the lowest producer share (46.84%) (39.88 per cent). The channel I marketing efficiency ratio was found to be the greatest. Pavithra *et al.* [13] calculated the cost of marketing between the two chosen talukas of Tumkur district, Pavagada and Gubbi. The farmers in Pavagada received a greater net price (Rs. 2413) than those in Gubbi taluka due to the high marketing costs spent per Pindi (Rs.1698). Both the price that was paid and the farmer's expenses were high in the far-off market. However, the net price realised in the distant market was likewise high. Farmers in the Gubbi taluka paid less in marketing costs (Rs. 83/P) than those in the Pavagada taluka (Rs. 160/P), primarily because of commission and transportation costs. Arrival and market prices for betel leaves showed seasonality.

3. DATA AND METHODOLOGY

Tamil Nadu is one the leading betel leaf cultivating states in the country. More than 70000 tonnes of betel leaf are grown on around 9000 acres in the state. Betel leaves produced in the Kumbakonam is renowned for being the best in the state due to their strength and freshness. Although the Namakkal district is one of the main betel leaf growers, dealers claim that the leaf grown in Thanjavur, especially Kumbakonam, is different. The Thanjavur government recently submitted an application for Kumbakonam Vettrilai to receive a GI (Geographical Indication) tag. The soil's fertility and river Cauvery's water supply, this Vettrilai betel leaf stands out from other betel leaves. Hence Thanjavur district was selected for the study. Sampling techniques included simple random sampling and selective sampling. From Thanjavur district two blocks viz.,

Thiruvaiyaru and Kumbakonam block were chosen and villages were randomly chosen from each block. For the study, 90 samples in total were chosen, including 60 betel vine farmers, 10 commission brokers, 10 village dealers, 5 wholesalers and 5 retailers. The use of a well-structured interview schedule allowed for the collection of information from farmers regarding the cost and return of producing betel vines. From the local marketplaces in Thanjavur District, village traders, commission agents, wholesalers and retailers were chosen.

Table 1. Details of Selected Blocks and Villages in Thanjavur District

S. No	Block	Villages
1.	Kumbakonam	Swamimalai Patteeswaram
2	Thiruvaiyaru	Achanur Nadukavery

Table 2 Details of sample respondents

S. No	Respondents	No. of Samples
1	Betel Vine Farmers	60
2	Village Traders	10
3	Commission Agents	10
4	Wholesalers	5
5	Retailers	5
	Total	90

3.1 Tools for Analysis

3.1.1 Marketing cost

Marketing costs was the total expenditure on the marketing activities. Transportation costs, commission charge, labour costs for loading and unloading are all included in marketing costs.

$$C = CF + C_{m1} + C_{m2} + \dots + C_{mn}$$

Where,

C is Total Marketing cost, CF is cost paid by producer, C_{mi} is Cost incurred by I^{th} middleman

3.1.2 Marketing margin

Marketing margin represented the difference between price paid and received by a given market intermediary in the marketing of a commodity.

3.1.3 Marketing channel

Moving goods from the place of origin to the point of consumption was referred to as a

marketing channel. A marketing channel's main goal is to establish a connection between the farmers that produced a good and potential client who might be interested in buying it.

3.1.4 Price spread

The difference between the net price received by consumer and price received by the producers is the price spread.

$$\text{Price spread} = P_p - P_f$$

Where,

$$P_p = \text{Price received by the agent}$$

$$P_f = \text{Price received by the farmer}$$

3.1.5 Marketing efficiency

The cost of getting products from the manufacturer to the consumer and the quality of the services provided directly affect marketing effectiveness. It will be effective marketing if the expenses incurred are less than the value of the services provided. An increase in marketing effectiveness results in lower marketing expenses without a decrease in the volume of consumer services delivered.

3.1.6 Shepherd method

This can be measured from the ratio of total value of goods marketed to the marketing costs. The higher the ratio, the higher the efficiency and vice versa. In the study, the efficiency of the betel vine marketing system was evaluated using the following marketing efficiency measures.

$$ME = (V/I) - 1$$

Where,

$$ME = \text{Marketing efficiency}$$

$$V = \text{Value of goods sold or consumer price}$$

$$I = \text{Total marketing cost}$$

3.1.7 Acharya's approach

According to Acharya, an ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate market channels should be taken into account. The following measure was used to estimate marketing efficiency.

$$\text{Marketing Efficiency} = \frac{\text{Farmer price}}{(\text{Marketing cost} + \text{Marketing margin})}$$

3.1.8 Farmer's share in consumer price

It can be calculated by using the following formula.

$$\text{Farmer share} = (\text{Farmer net price}/\text{Consumer Price}) * 100$$

4. RESULTS AND DISCUSSION

4.1 Marketing Cost of Betel Leaf

Due to the perishability of the leaves, betel leaves were collected, packed and sold all on the same day. Using banana leaves, a wooden box and an arecanut sheath [one Pendi = 12000 leaves] formed by stacking and packing twenty bundles of 100 leaves (12000 leaves). Trucks, auto rickshaws, or buses were used to deliver these Pendi to the nearby market places. In Thanjavur district Betel leaves were auctioned in the auction market, which was held three times a week in the evening.

4.2 Channels of Distribution

In this study, "channels of distribution" referred to a group of organisations and movements involved in the trade of betel vine from the producer to the consumer. In Thanjavur district, middlemen such as village traders, commission agents, wholesalers and retailers were used to sell the betel vine. The identified distribution were.

- Channel I: Producer → Village Trader → Wholesaler/Retailer → Consumer
- Channel II: Producer → Commission Agents → Wholesaler/Retailer → Consumer
- Channel III: Producer → Retailer → Consumer

4.3 Marketing Cost Incurred by Betel Vine Growers

The amount spent on marketing following the harvest but before the growers sell their grapes is known as the marketing cost. Costs are incurred for a number of activities, including as transportation, loading and unloading, weighing, packaging and commission. Farmers use a variety of distribution channels to sell their produce, therefore marketing expenses vary. It was clearly understood that average cost spent by growers per pendi of grape was Rs. 170. The marketing cost incurred for cleaning, grading of leaf and sorting by farmers constituted about 26.4 per cent followed by commission charges

(25.3 per cent), transportation cost (20.6 per cent) and packing and counting charges (18.8 per cent) respectively. They spent 8.9 per cent on miscellaneous charges.

4.4 Marketing Cost Incurred by Village Traders

Average cost spent by village trader was found to be Rs.130 per pendi of betel leaf. Marketing cost involved both fixed and variable cost. Major marketing cost incurred for transportation cost were accounted to be 44.8 per cent followed by loading and unloading by village traders from the farm with 22 per cent, cost towards packing cost (11.7 per cent), amount paid for rent, electricity and telephone (7.70) followed by other expenses (4.61 per cent) respectively.

4.5 Marketing Cost Incurred by Commission Agents

The marketing cost of commission agents per pendi of betel leaf worked out to be Rs. 120. Packing cost accounted for major share (30.8 per cent) of the total marketing cost followed by loading and unloading charges (20.8 per cent), cost towards rent and electricity charges (14.1 per cent) followed by transportation cost (13.3 per cent), license fee accounted (12.5 per cent). Other miscellaneous cost accounted (8.3 per cent).

4.6 Marketing Cost Incurred by Wholesaler/Retailer

The marketing cost incurred by wholesaler/retailer per pendi of betel leaf worked out to be Rs. 130. Loading and unloading cost accounted for major share (24.5 per cent) of the total marketing cost followed by packing charges (20.8 per cent), cost towards rent and electricity charges (17.51 per cent) followed by transportation cost (10.5 per cent), Other miscellaneous cost were accounted (8.3 per cent) followed by license fee (7.7 per cent) respectively.

4.7 Price Spread Analysis

In order to analyse the marketing efficiency of different methods of distribution in the present study, the net price obtained by producer, total marketing cost and margin were examined individually for farmers. The survey was taken during 2022 in the month of May-June.

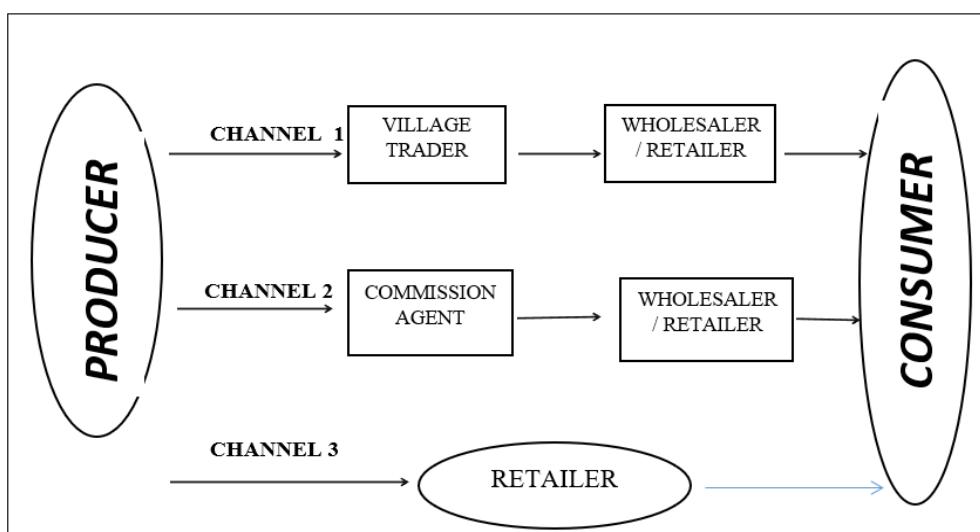


Fig. 1. Marketing channels of Betel vine

Table 3. Marketing cost incurred by betel vine growers

S. No	Particulars	Cost (Rs./Pendi)	Percentage
1	Cleaning, Grading and sorting	45	26.4
2	Packing & counting charge	32	18.8
3	Commission charges	43	25.3
4	Transportation cost	35	20.6
5	Miscellaneous charges	15	8.9
	Marketing cost (C/pendi)	170	100

Table 4. Marketing cost incurred by village traders

S. No	Particulars	Cost (Rs. /pendi)	Percentage
1	Packing cost	17	11.7
2	Transportation cost	65	44.8
3	Loading and unloading charges	32	22.0
4	Rent, Electricity & telephone	10	7.70
5	Miscellaneous charges	6	4.61
	Total	130	100

Table 5. Marketing cost incurred by commission agents

S.no	Particulars	Cost (Rs/Pendi)	Per cent
1	Packing charges	37	30.8
2	Transportation charges	16	13.3
3	Loading and unloading charges	25	20.8
4	License fee	15	12.5
5	Rent, Electricity & telephone	17	14.1
6	Miscellaneous charges	10	8.3
	Total	120	100

The channel I the farmers received net price were accounted 69.5 per cent to consumer price. The marketing cost and marketing margin of village traders were about 4.3 per cent and 6.6 per cent respectively. The price received by village trader accounts for 80.4 per cent

respectively. The marketing cost and margin of wholesaler or retailer was about 4.3 per cent and 15.23 per cent respectively. The sales price of the retailer was Rs. 3020. Thus the marketing cost incurred by the retailer was high in channel I. The price spread for channel I was Rs.920.

Table 6. Marketing cost incurred by Wholesaler/retailer

S. No	Particulars	Cost (Rs/Pendi)	Per cent
1	Packing cost	30	20.9
2	Transportation cost	15	10.5
3	Loading and unloading charges	35	24.5
4	License fee	10	7.7
5	Rent, Electricity & telephone	25	17.5
6	Miscellaneous charges	15	11.5
	Total	130	100

Table 7. Price spread analysis for different marketing channels

S. No	Particulars	Channel I	Channel II	Channel III
I. Producer				
1	Gross price received	2100 (69.5)	2150 (69.3)	2400 (81.9)
2	Marketing cost	---	170 (5.4)	110 (3.7)
3	Net price received by farmers	2100 (69.5)	1980 (63.8)	2290 (77.3)
II. Village traders				
1	Price paid	2100 (69.5)	--	--
2	Marketing cost	130 (4.3)	--	--
3	Marketing margin	200 (6.6)	--	--
4	Amount received by traders	2430 (80.4)	--	--
III. Commission agent				
1	Price paid	---	2150 (69.3)	--
2	Marketing cost	---	120 (3.8)	--
3	Marketing margin	---	230 (7.41)	--
4	Amount received by commission agents	---	2500 (80.6)	--
IV. Wholesaler/retailer				
1	Price paid	2430 (80.4)	2500 (80.6)	2400 (81.0)
2	Marketing cost	130 (4.3)	130 (4.1)	60 (2.0)
3	Marketing margin	460 (15.23)	470 (15.16)	500 (16.90)
4	Amount received by wholesaler/retailer or paid by the consumer	3020 (100)	3100 (100)	2960 (100)
	Price spread	920 (30.4)	950 (30.6)	560 (18.9)

Table 8. Price spread and returns of betel vine for all marketing channel

S. No	Particulars	Channel I	Channel II	Channel III
1	Net price received by the grower	2100 (69.5)	2150 (69.3)	2400 (81.9)
2	Net margin of village trader	200 (6.6)	-	-
3	Net margin of commission agent	-	230 (7.41)	-
4	Wholesaler/retailer net margin	460 (15.23)	470 (15.16)	500 (16.90)
5	Total cost of marketing	260 (8.6)	420 (13.5)	170 (5.74)
6	Total marketing margin	660 (21.85)	700 (22.5)	500 (16.90)
7	Purchasing price	3020 (100)	3100 (100)	2960 (100)
8	Price spread	920 (30.4)	950 (30.6)	560 (18.9)

It can be observed that in Channel II the farmers received net price were accounted 69.3 per cent to consumer price. The marketing cost incurred by the farmers was about 5.4 per cent and the

net price received by the farmers was Rs. 1980. The marketing cost and marketing margin of commission agents was about 3.8 per cent and 7.4 per cent respectively. The amount

received by the agents was about 80.6 per cent. The marketing cost and marketing margin of wholesaler or retailer was about 4.1 per cent and 15.16 per cent respectively. The sales price to the consumer is Rs.3100 and price spread in Channel II was Rs.950.

It can be observed that in Channel III the farmers received net price were accounted 81.9 per cent to consumer price. The marketing cost incurred by the farmers was about 3.7 per cent and the net price received by the farmers was Rs. 2290. The marketing cost and marketing margin of retailer was about 2.0per cent and 16.90 per cent respectively. The sales price to the consumer was Rs.2960 and price spread in Channel II was Rs.560. Thus, the marketing cost was low in marketing channel III.

The efficient marketing channel was channel III (Producer → Retailer → Consumer) because it has the lowest price spread of 18.9 per cent which be due to a smaller number of intermediaries. So, channel III said to be the best. Channel I and channel II constituted highest price spread with 30.4 and 30.6 respectively.

4.8 Marketing Efficiency

If the overall marketing margin was educed for a given marketing cost, marketing was said to be

efficient. In another way, the marketing margin that was lowest overall would indicate that a channel was effective. In this study the marketing efficiency of three channels was examined by using two methods a) Shepherd and b) Acharya and Agarwal method.

4.9 Marketing Efficiency by Shepherd's Method

When total marketing margins are more than marketing cost per unit, marketing was said to be efficient. The marketing efficiency in channel III (16.1) was higher than in channel I (10.6) and channel II (6.3) respectively. Thus, marketing of betel leaf in channel III was more efficient for farmers.

4.10 Marketing Efficiency by Acharya and Agarwal's Method

Marketing efficiency in channels III was higher when compared to the rest of channel. The fact that channel III had just one middle man, its marketing efficiency index of 3.5 was higher than that of the other channels.

On the other hand, the efficiency indices for channels I and III were 2.8 and 1.9 respectively. Channel III was more effective because it has lower marketing costs and margins.

Table 9. Marketing efficiency by Shepherd's method

S. No	Particulars	Channel I	Channel II	Channel III
1	Consumer price (V)	3020	3100	2960
2	Total marketing cost (I)	260	420	170
3	Shepherd's marketing efficiency ME=(V/I)-1	10.61	6.38	16.11

Table 10. Marketing efficiency by Acharya and Agarwal's method

S. No	Particulars	Channel I	Channel II	Channel III
1	Total marketing cost (I)	260	420	170
2	Total marketing margin	660	700	500
2	Price received by the farmers	2100	2150	2400
3	Efficiency ME=FP/MM+MC	2.28	1.91	3.58

Table 11. Farmer share in consumer price

S. No	Particulars	Channel I	Channel II	Channel III
1	Farmers price (FS)	2100	2150	2400
2	Consumer price (CP)	3020	3100	2960
3	Formula =FS/CP*100	70.0	69.3	81.08

5. CONCLUSION AND POLICY IMPLICATIONS

The channel I farmers received net price were accounted 69.5 per cent to consumer price. In Channel II the farmers received net price were accounted 69.3 per cent to consumer price. Channel III the farmers received net price were accounted 81.9 per cent to consumer price. Marketing efficiency in channels III was higher when compared to the rest of channel. The fact that channel III had just one middle man, its marketing efficiency index of 3.5 was higher than that of the other channels. Price volatility seems to be the main issue as mentioned by the respondents, as shown in the results referring to the constraints faced. Crop growth is encouraged by stable prices, which can be achieved by market intervention or price support, even for perishable plantation crops like betel leaves. In order to resolve the labour issue, appropriate mechanisation must be encouraged, either through group efforts or on a government-custom hiring basis. To decrease the post-harvest loss of perishable leaves and improve post-harvest technologies, efforts are required. It is advisable to promote the export of leaves, as this raises the price prevalent and brings in a lot of money. It was found that, there were no relationships between producers and researchers for the transfer of betel vine production technologies, which would have affected production in terms of returns. A more effective extension method is required to move technology from the lab to the field and to provide insightful feedback to determine the areas that require additional development. According to the study, there is no government involvement of any kind and commission agents (who are small in number) oversee the entire marketing system (organized marketing). The growth of the organised market directly affects the crop. In order to prevent fraud in the marketing system used by private dealers in the study region, the government may intervene in this matter.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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