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### A study on price behaviour of reeling cocoons in Karnataka

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#### Abstract

In recent years many of the sericulture farmers were afraid because of not stabilized cocoon price. In this concern we selected Ramanagara cocoons market and reelers to study the reasons behind the cocoon price crisis. As per our study the price of cocoons has been influencing by many factors. Such as, prices of international (Chinese) and domestic silk, demand for silk products of particular season/period, quantum of the arrival of a cocoon, weather conditions, Government policies etc. To overwhelm these problems it is necessary to strengthen the Government marketing agencies in the cocoon and the raw silk buying. It is better to use the technologies to inform the forecasting prices to farmers as well as reelers in advance. Try to establish cocoon banks and providing minimum support price to farmers. Reelers should not be allowed to procure more than their requirement. These solutions will help to save the sericulture farmers from severe cocoon price crises.

**Keywords:** Cocoon, crisis, farmers, Ramanagara, market, reelers, silk and price

#### Introduction

The Indian silk industry plays a leading role in the global silk market, by contributing 36.80% of global silk production (International Sericulture Commission 2020). It is considered as the epitome of distinctiveness in silk production for producing all types of silk, i.e., Mulberry and Vanya (Eri, Muga, and Tasar). The industry produces around 23,896 MT of mulberry, 2,689 MT of tasar, 6,946 MT of eri, and 239 MT of muga silk to meet the domestic requirement. India's silk export worth are approximately US\$ 360 million, of which 70% are natural silk yarn and fabrics, 13% are made-ups, and 26% are garments (Anonymous, 2022) <sup>[5]</sup>. With all these attributes sericulture enterprise holds the interests of over 9.2 million people, mostly from rural areas, dependent on the sector for their livelihoods and earnings. But the profitability of sericulture enterprise depends on the production of quality mulberry leaves and their conversion into quality cocoons at an economic cost (Ganga and Chetty, 1991) <sup>[6]</sup>. And also the growth and expansion of any enterprise depends on the profit and pricing of their industrial products marketed. As a result, farm product pricing is an essential instrument that influences the farmer's decision to select an enterprise and allocate land and resources to those operations. Since the silk business is a 'commercial industry,' the gross value of silk fabrics flows as follows: 56.8% to the cocoon grower, 6.8% to the reeler, 9.1% to the twister, 10.7% to the weaver, and 16.6% to the trade (Mahanta and Komal, 2022) <sup>[4]</sup>. Because cocoon growers are the key stakeholders in the sericulture enterprise, the price of cocoon has a significant impact on their output. Recent research has also found a link between sericulture producers' reactions to price swings (Roopa and Murthy, 2015) <sup>[2]</sup>. But, cocoon prices crash once every three or four years for a brief period, causing farmer

unrest. Because of the price drop, producers are confronted with the decision of whether to continue or discontinue sericulture. Since mulberry is a perennial crop, once uprooted by the farmers due to the crash in cocoon prices, it is very difficult to bring the farmers back into sericulture after the stabilization of prices. It is therefore necessary to understand the price behavior of cocoons and the factors influencing wide fluctuations in cocoon prices in order to take the necessary measures to stabilize the cocoon price. In this context, the present study was undertaken to analyze the price behavior of cocoon by keeping the following objectives.

1. to identify the factors influencing the fluctuation of prices,
2. to analyze the trend in arrivals and prices of cocoon in the Ramanagaram market of Karnataka.

#### Materials and Methods

##### Methodology

The primary data for the study was collected directly from reelers by personal/ individual contact method. Secondary data on cocoon arrivals & prices on monthly basis were collected from Central silk board, state department of sericulture and Ramanagaram cocoon markets.

##### Analytical Tools and Techniques

Keeping in view the specific objectives of the study, the secondary data was tabulated and analysed using suitable statistical techniques. Descriptive statistics, cross correlation supply (arrival of cocoons) & price were correlated after grouping the cocoon lots into different categories. Yearwise, lot-wise both Bivoltine and Cross breed cocoon transactions at Ramanagaram were grouped using frequency distribution.

1. A seasonal index is a way of measuring the seasonal

variations that is, to measure the changes due to seasonal changes. Monthly Seasonal Indices of cocoon and silk transacted at ramanagaram markets and exchanges has been calculated using multiplicative model to study. Monthly seasonal performance with yearly average.

- Compound Growth rate(CGR):-The data on prices for different periods as well as entire period of analysis by fitting an exponential distribution function as follows:

$$X=ab$$

$$\log X = \log a + \log b$$

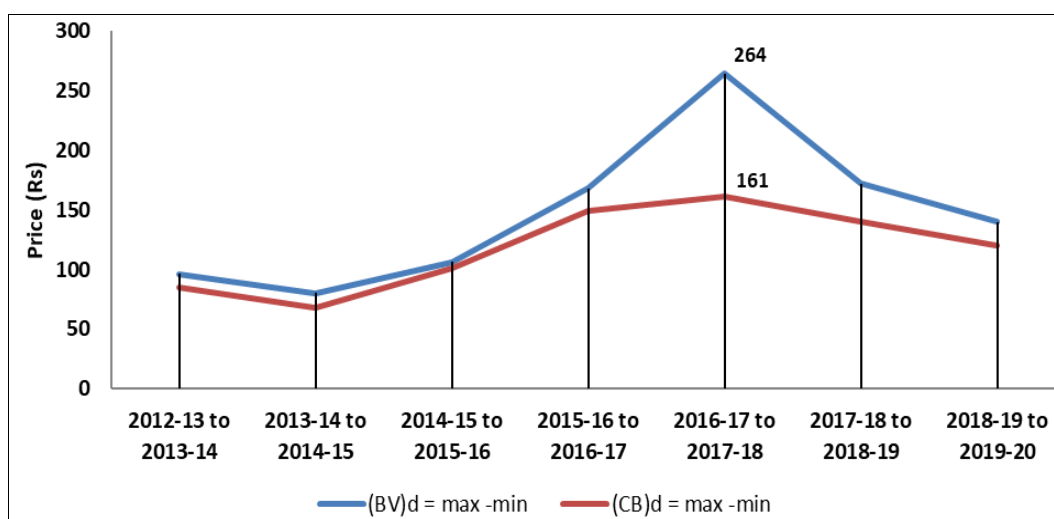
Where, b is the regression coefficient and is the intercept, a is the time and X is the price of the cocoon in different period

$$\text{CGR (Compound growth rate)} = (\text{antilog of } b - 1) * 100$$

## Result and Discussion

### Cocoon price fluctuation in the Ramanagaram cocoon market

The graph depicts year wise cocoon price fluctuation in the Ramanagaram market, which clearly indicates the maximum price fluctuation of bivoltine and cross breed cocoons occurred during 2016-2018. The highest difference in the BV cocoon price was noticed at 264 rupees, with the maximum and minimum cocoon prices being 534 and 270, respectively. The highest difference in the CB cocoon price was noticed at 161 rupees, with the maximum and minimum cocoon prices being 440 and 279, respectively (Graph 1). Therefore, our study was further carried out to analyse factors that influence the price fluctuation by considering secondary data for the years 2016 to 2019.

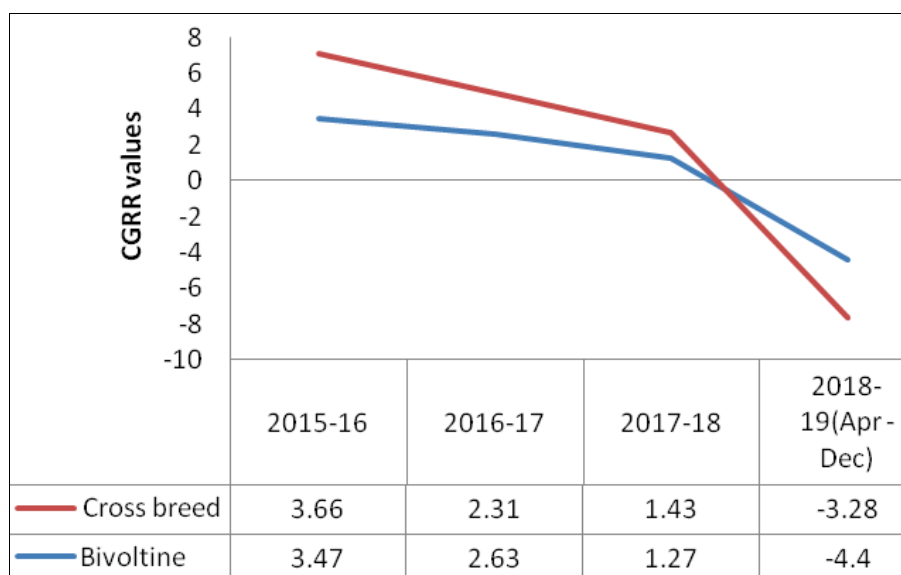


**Graph 1:** Showing wise cocoon price fluctuation in the ramanagaram market

### Compound growth rate of cocoons price

Compound growth rates of cocoons price for 4 years (2015-16 to 2018-19) in Ramanagaram cocoon market for bivoltine and cross breed was shows in Graph 2. CAGR was

highest in 2015-16 for both Bivoltine and cross breed cocoons in Ramanagaram market, but began to decline in 2018-19.



**Graph 2:** Compound growth rate of cocoons price

### Cocoon production and transaction effect on reeling cocoons market arrival in the Ramanagaram market

The table-1 depicts the percentage of arrival of reeling cocoons both BV and CB cocoons into the Ramanagaram market against production was correlated. The both the parameters for Bivoltine cocoon of positively correlated with the correlation coefficient value  $r = 0.402$ . Similarly

there is also existence of positive correlation  $r = 0.602$  between total transaction of cocoon to its arrival percentage for cross breed cocoon. Therefore, in order to ascertain how the arrival influence the cocoon price, cocoon arrival and cocoon price in the month of the year compared to the same months of the previous year.

**Table 1:** The percentage of arrival of reeling cocoons into the market against production and transaction in the Ramanagaram market

Years	Bivoltine and Cross breed cocoons			
	Total production	Total Arrival %	Total transaction*	Total Arrival %
2014-15	68298	77.5	53535	77.5
2015-16	70436	76.3	53542	76.3
2016-17	67509	74.1	47030	74.1
2017-18	66017	66.4	43536	66.4
2018-19(Apr -Dec)	46170	70.7	34198	70.7
r value	0.402		0.602	
Correlation type	positive		Positive	

\*include cocoons from Andhra Pradesh and Tamil Nadu

### Gradient (Increasing/Decreasing) in bivoltine and cross breed reeling cocoon month-wise between current and previous year transacted at Ramanagaram

**Table 2:** Gradient (Increasing/Decreasing) in Bivoltine reeling cocoon month-wise between current and previous year transacted at Ramanagaram

Months	Gradient in Bivoltine cocoon arrival and price							
	2015-16 over 2014-15		2016-17 over 2015-16		2017-18 over 2016-17		2018-19 over 2017-18	
	Qty (MT)	Price (Rs/Kg)	Qty (MT)	Price (Rs/Kg)	Qty (MT)	Price (Rs/Kg)	Qty (MT)	Price (Rs/Kg)
April	122	-78	-58	78	-55	155	146	-85
May	156	-112	-124	145	28	67	109	-47
June	83	-118	-13	171	-33	60	169	-102
July	73	-108	59	130	-74	67	237	-101
August	14	-52	128	131	-154	73	245	-136
September	46	-78	16	128	-51	65	201	-119
October	96	-53	-35	174	-5	12	125	-91
November	42	-56	-8	183	8	64	36	-177
December	-4	15	39	65	-71	179	175	-237
January	-46	48	72	104	-34	72		
February	113	54	-101	148	24	54		
March	-52	83	-96	155	184	-22		
Correlation	-0.64*		-0.30*		-0.61*			

\*significant at 5%

**Table 3:** Gradient (Increasing/Decreasing) in cross breed reeling cocoon month-wise between current and previous year transacted at Ramanagaram

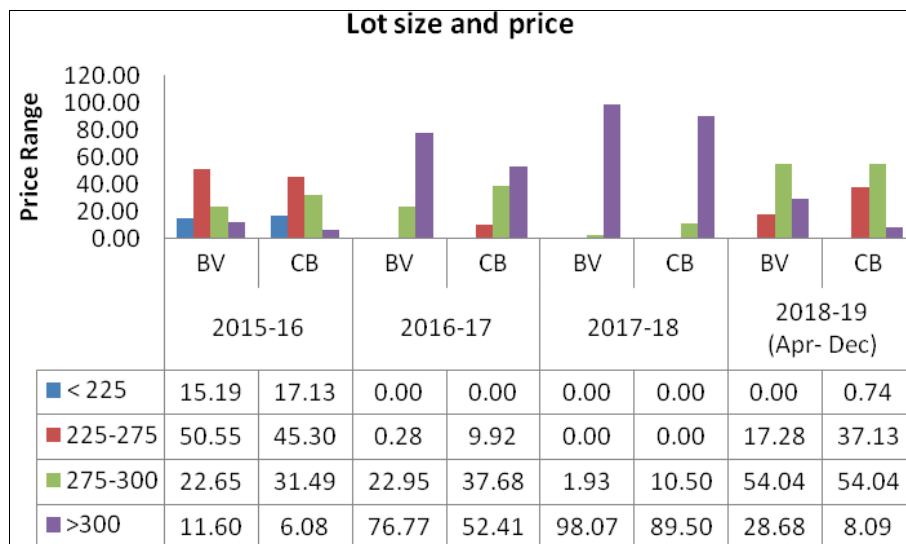
Months	Gradient in Cross breed cocoon arrival and price							
	2015-16 over 2014-15		2016-17 over 2015-16		2017-18 over 2016-17		2018-19 over 2017-18	
	Qty (MT)	Price (Rs/Kg)	Qty (MT)	Price (Rs/Kg)	Qty (MT)	Price (Rs/Kg)	Qty (MT)	Price (Rs/Kg)
April	-21	-60	-94	55	-172	119	286.14	-88
May	136	-97	-353	130	86	47	126	-61
June	5	-92	-338	161	100	24	212	-116
July	89	-96	-86	96	-81	65	175	-105
August	-59	-42	-22	105	-113	42	115	-97
September	115	-86	-61	101	-110	37	4.1	-81
October	6	-39	-175	142	36	-2	100	-88
November	-76	-78	-142	160	-39	41	261	-151
December	-151	-12	84	44	-308	165	258	-197
January	-91	17	42	79	36	60		
February	-190	48	-81	105	29	41		
March	-134	58	-127	108	-14	-9		
Correlation	-0.83*		-0.75*		-0.77*			

\*significant at 5%

Arrival of bivoltine and cross breed cocoons at Ramanagaram in the various months of the year compared to the same months of the previous year. The correlation between gradient in cocoon arrival and price for Bivoltine during 2015-16 over 2014-15 was  $r = -0.64$ , similarly for during 2016-17 over 2015-16 was  $r = -0.30$  and during 2017-18 over 2016-17 was  $r = -0.61$ . The correlation between gradient in cocoon arrival and price for Cross breed during 2015-16 over 2014-15 was  $r = -0.83$ , similarly for during 2016-17 over 2015-16 was  $r = -0.75$  and during 2017-18 over 2016-17 was  $r = -0.77$ . It is clear that there was an increase in the arrival of both bivoltine and cross-breed cocoons during all the months of 2018-19 compared to the

corresponding months of 2017-18, has reduce the cocoon price drastically during 2018-19. And also, the study reveals that there is a negative relationship between the price increase of cocoons and their arrival on the markets each year (Table 2 & 3). Therefore, it is clear that cocoon supplies decreases in the market, the price of cocoon in the market increases, and vice versa. Similar report was made that the price of cocoon is totally determined by the arrival of cocoon and demand for the product in the market (& Vijaysanthi, 2011).<sup>[1]</sup>

#### Lot size and price band at Ramanagaram cocoon market



**Graph 3:** Lot size and price band at Ramanagaram cocoon market during 2015-19

The graph (3) reveals the lot size and price associated at Ramanagaram cocoon markets during 2015 to 19. Interestingly 98% and 89.50% of the Bivoltine and Cross Breed lots has price of more than 300 have traded during 2017 -18, but surprisingly in 2018-19 only 28.68% and 8.09% Bivoltine and Crossbreed cocoon average price was

> 300 Rs. Therefore, this clearly indicates the price fall occurred during 2018-19 either due to huge flow of cocoons into the market or inferior quality compared to previous year (Table 2 and 3).

#### Seasonal indices of reeling cocoons and raw silk

**Table 4:** Month wise seasonal indices of reeling cocoons and raw silk price

Month	Ramanagaram market				Multiend silk	% of incr/ decr over average	Cottage Basin silk	% of incr/ decr over average
	BV	% of incr/ decr over average	CB	% of incr/ decr over average				
April	1.058	5.8%	1.078	7.8%	1.013	1.3%	1.013	0.013
May	1.01	1.0%	0.971	-2.9%	0.983	-1.7%	0.968	-0.032
June	0.995	-0.5%	0.931	-6.9%	0.969	-3.1%	0.962	-0.038
July	0.821	-17.9%	0.819	-18.1%	0.963	-3.7%	0.968	-0.032
August	0.931	-6.9%	0.951	-4.9%	0.954	-4.6%	0.95	-0.05
September	0.923	-7.7%	0.909	-9.1%	0.929	-7.1%	0.949	-0.051
October	1.035	3.5%	1.035	3.5%	1.212	21.2%	1.229	0.229
November	0.924	-7.6%	0.931	-6.9%	0.967	-3.3%	0.967	-0.033
December	0.966	-3.4%	0.988	-1.2%	0.979	-2.1%	0.964	-0.036
Januvarry	1.103	10.3%	1.114	11.4%	0.994	-0.6%	1.004	0.004
Febravary	1.141	14.1%	1.148	14.8%	1.021	2.1%	1	0
March	1.095	9.5%	1.126	12.6%	1.019	1.9%	1.02	0.02
	1.000		1.000		1.00		1.00	

Source: Central silk board

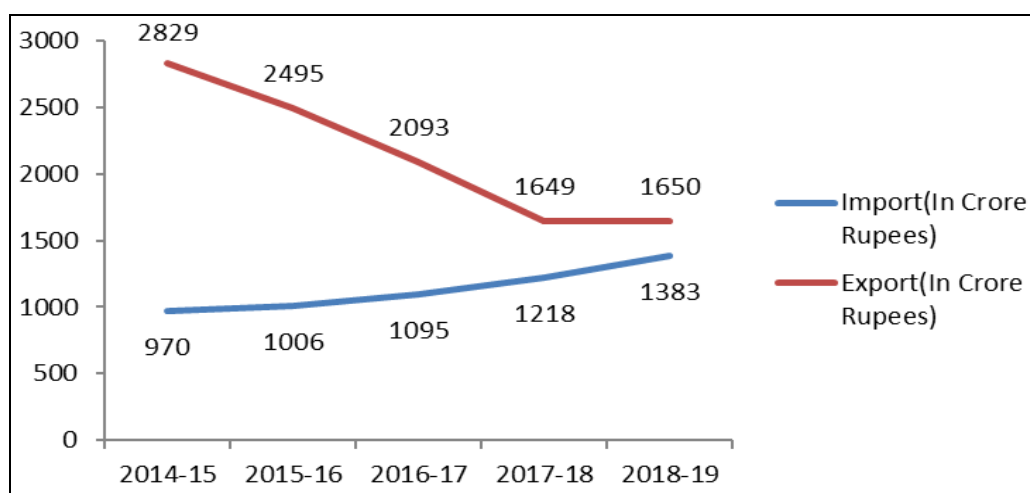
**Table 5:** Seasonal indices of reeling cocoons and raw silk price

Seasonal Index	Seasonal month		
	Bivoltine reeling cocoons	Cross breed reeling cocoon	Raw silk
Less than 0.9 (low season)	July	July	-
0.9-1.0 (moderate season)	June, Aug, Sep, Nov, Dec	May, Jun, Aug, Sep, Nov, Dec	May, Jun, Aug, Sep, Nov, Dec, Jan
More than 1 (high season)	Apr, May, Oct, Jan, Feb, Mar	Apr, Oct, Jan, Feb, Mar	Mar, Apr, Oct, Feb

It is evident from the above table 4 & 5 that, seasonal indices of prices of reeling cocoon in Ramanagaram cocoon market and raw silk in Karnataka Silk Exchange are lower than yearly seasonal average during June, Jul, Aug, Sept, Oct, Nov & Dec indicates the lower trading price. There is strong relationship between the seasonal indices of the prices between cocoon and silk. Price fall of the silk during these months is also a factor for reduction in cocoon prices.

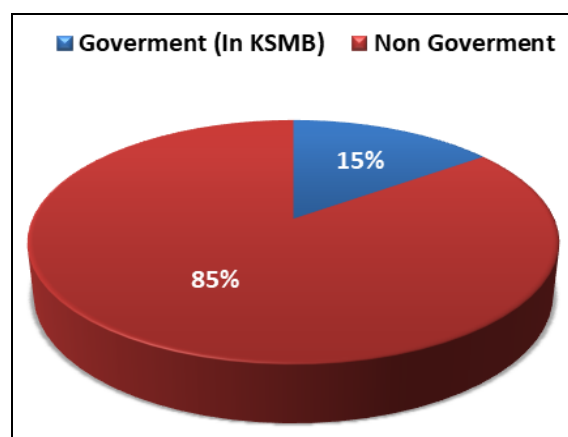
The seasonal index during Jul, Aug, Sept, Nov & Dec are low due to the transaction of inferior quality of cocoon may be due to the low leaf quality during rainy and winter months. Therefore, different season has an impact in cocoon price fluctuation in 2018-19.

#### Raw silk Import and Export in India

**Graph 4:** The raw silk import and export trend in India from 2014-19

The graph-4 depicts that year wise raw silk import and export trend from 2014-15 to 2018-19. Importing of raw silk is increasing gradually and in the year 2018-19 is 1383(Cr), it is the highest when compare to previous years. Surprisingly, the graph shows the exporting of silk goods is also decreasing by year on year. And in the year 2018-19 exporting of silk goods only 1650(Cr) which was very less when compare to previous years. Hence, increasing in domestic production, increasing in import of raw silk and decreasing in export of silk goods in the year 2018-19 decrease demand in market. Therefore the cocoon price reduction happens in the domestic market in 2018-19. As a consequence, government should take step-up in reducing the import of international (Chinese) silk for price stabilization in the domestic markets. Similar suggestion was given for price stabilization in cocoon markets of Tamil Nadu by Selvaraj & Vijaysanthi, (2011) <sup>[1]</sup>.

#### Raw silk transaction by reelers of Ramanagaram District

**Graph 5:** Raw silk transaction by reelers by Ramanagaram district

The present survey was conducted for 60 reelers by interview method using a predefined questionnaire with reelers. According to this survey, only 15-20% of the reelers will transact the raw silk through KSMB, remaining 80-85% of the reelers will transact the raw silk without involvement of government and it means the transacting the raw silk outside the KSMB (Graph 5). This will leads to fixing and controlling of price for raw silk by non-governmental organization. Therefore, raw silk transaction by other than government become one of the factor which has influence in price fluctuation.

### Reelers turnover of Ramanagaram District

**Table 6:** Categories of reelers in the Ramanagaram District and their respective turnover

Sl. No	Types of reelers	Turnover (Rs)	Percent (%)
1	Small scale reelers	<30,000	35-40
2	Medium scale reelers	30,000 to 1 lakh	40-45
3	Large scale reelers	>1 lakh	10-15

According to the survey maximum of reelers are medium scale reelers (40-45%), but the price is fixed/ decided by large scale reelers, because they purchase more than their requirement when the prices are very low in the cocoon market. Therefore, each reeler should be allowed to bid any lot with unique price only. He should not be allowed to change the price to downsize for a lot which prevent price fluctuation to certain extent.

### Conclusion

The study reveals that the price fluctuation of cocoons has been influencing by many factors. Such as, prices of international (Chinese) and domestic silk, demand for silk products of particular season/period, quantum of the arrival of a cocoon weather conditions, Government policies etc. Therefore, strengthening Government marketing agencies for more active participation in the raw silk market is mandatory. Moreover, the purchase prices of these agencies should fix the reference or basic price in the market, leading in price stabilization. Furthermore, Marketing information/intelligence/forecasting of prices and arrivals is very essential for the reeling units as well as farmers as this will assist them in planning production and marketing of their produce (Halagundegowda *et al.*, 2019) <sup>[3]</sup>. Establishment of cocoon banks and procure cocoons from the farmers during distress time and providing minimum support price. If all these factor consider and rectified the farmers may show positive attitude towards sericulture.

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