

FOUR CORNERS' PERCEPTION ON FLORICULTURE INDUSTRY -AN ECONOMIC ANALYSIS

Abstract

Floriculture may be defined as "the art and knowledge of growing flowers to perfection". Being a branch of Horticulture, it deals with the cultivation of flowers and ornamental crops from the time of planting to the time of harvesting. It also includes production of planting materials through seeds, cutting, budding, grafting, etc up to the marketing of the flower and flower produce. Floriculture is a part of horticulture, an agricultural activity which has been on the rise during the past decades. It is different from traditional culture, not only due to the increased sales revenues, but also because flowers are ever more present in daily life, which has created opportunities for engaging in floriculture as a legitimate source of income. The aim of the paper is to present the current situation in the area of floriculture in the India and in West Bengal, as well as to draw attention to the relationship between the different factors at the various level of this industry. Floriculture is not desirable widespread in India, even though there are quite advantageous climatic conditions, fertile land, tradition and experience, but not enough innovation, inadequate equipment, technological lagging behind in production and insufficient harmonization. The opportunity of this sector is very bright in near future as Indian Economy is one of the Largest Agriculture Based Economy. Through this research work I have tried my level best to describe the industry by analysing it from Four Corners' i.e 1. *Production Scenario* 2. *Wholesale Market* 3. *Retail Market* 4. *Consumer Behaviour(While Purchasing Flowers)*. I think that this research work will help the policy makers, entrepreneurs and investors in their course of activity.

Keywords: Floriculture, Production, Producer, Wholesale Market, Retail Market, Consumer ,Consumer behaviour etc.

Author

Dr. Barun Kumar Das
Assistant Professor
Department of Commerce
City College of Commerce
and Business Administration
Kolkata, India
barunkumar17@gmail.com

I. INTRODUCTION

Floriculture also known as flower farming refers to the cultivation of flowering and ornamental plants. Although flowers have been an integral part of the Indian society and were cultivated for various purposes ranging from aesthetic to social and religious purposes, the commercial floriculture industry has been of recent origin. A strong increase in the demand for cut and loose flowers has made floriculture as one of the important commercial trades in Indian agriculture.

The Indian Floriculture market was worth INR 130 Billion in 2019. The market is further projected to reach INR 394 Billion by 2025, at a CAGR of 20% during 2020-2025. While exports remain a key motivator for cultivators, the domestic demand for flowers is also increasing exponentially, especially in the metros and larger cities. Modernization and growing western cultural influences have driven consumers to buy flowers on a number of occasions like Durga puja, marriages, anniversaries, birthdays, friendship day, Mother's Day, Father's Day, Valentine's Day etc. Large scale consumption of flowers is also carried out throughout the country during religious festivals. The metros and the larger Indian cities currently represent major consumers of flowers in the country.

Table 1: Import of Flowers in India (Qty in MT Value in Rs. Lacs)

Country	2018-19		2019-20		2020-21	
	Qty	Value	Qty	Value	Qty	Value
Netherland	1373.83	3408.34	1947.41	4386.40	1988.73	4327.04
Thailand	1549.72	4488.82	1611.16	4146.13	2016.29	3732.17
China	589.06	1105.11	508.71	1113.16	1014.22	1605.50
Italy	258.75	298.54	257.80	1236.87	232.02	1123.81
Iran	0.00	0.00	2.09	13.47	130.00	411.87
U K	22.71	235.71	33.57	331.67	22.39	354.59
New Zealand	51.37	116.42	88.51	226.64	111.01	285.45
Israel	25.99	205.46	18.88	170.47	24.48	235.54
Kenya	22.96	71.38	45.09	229.34	51.53	217.03
U S A	21.40	181.27	12.20	121.23	16.36	178.64
Others	853.02	1328.99	1034.93	1405.63	636.14	1174.46
Total	4768.81	11440.04	5560.35	13381.01	6243.17	13646.10

Data Source: APEDA website

Apart from aesthetic and decorative purposes, a significant amount of flower consumption also takes place in industrial applications. This includes flavors, fragrances, natural color, medicines, etc. We expect the consumption of these products to increase continuously during the forecast period creating a positive impact on the floriculture industry. **Government of India** has identified floriculture as a **Sunrise industry** and accorded it 100% export oriented status. Owing to steady increase in demand of flower floriculture has become one of the important Commercial trades in Agriculture. Hence commercial floriculture has emerged as hi-tech activity-taking place under controlled climatic conditions inside greenhouse. Floriculture in India is being viewed as a high growth Industry. Commercial floriculture is becoming important from the export angle. The liberalization of industrial and

trade policies paved the way for development of export-oriented production of cut flowers. The new seed policy had already made it feasible to import planting material of international varieties. It has been found that commercial floriculture has higher potential per unit area than most of the field crops and is therefore a lucrative business. Indian floriculture industry has been shifting from traditional flowers to cut flowers for export purposes. The liberalized economy has given an impetus to the Indian entrepreneurs for establishing export oriented floriculture units under controlled climatic conditions.

Table 2: Export of Floriculture from India - Country-Wise
(Qty in MT Value in Rs. Lacs)

Country	2018-19		2019-20		2020-21	
	Qty	Value	Qty	Value	Qty	Value
United States	5166.27	9679.11	3762.70	9902.23	3489.02	10497.73
Netherland	1883.90	5567.55	1809.32	5750.38	1855.00	6563.30
United Kingdom	2200.49	5603.43	2457.84	6838.96	2116.98	5320.13
Germany	2338.56	5692.88	2439.66	6241.66	1347.90	3667.89
United Arab Emirates	1550.28	2784.06	1438.84	3449.30	1211.45	2929.65
Canada	943.92	1736.13	748.52	1792.93	1133.35	2127.90
Italy	444.91	1135.73	555.10	1609.93	522.49	1661.09
Singapore	1176.73	1428.87	1347.01	1654.38	1956.81	1545.90
Japan	421.97	1596.52	365.05	1479.33	284.04	1360.83
Malaysia	419.89	888.40	520.82	1202.27	793.46	1325.61
Australia	397.44	1393.24	250.07	1306.72	198.74	1312.95
Spain	175.03	395.41	186.31	660.82	250.41	1032.57
Others	5572.27	10439.97	6139.11	12781.82	5543.82	11385.67
Total	22691.66	48341.30	22020.35	54670.73	20703.47	50731.22

Data Source: APEDA website.

II. REVIEW OF LITERATURE

Bhanumathy et al (2003), in their project report analyzed the marketing cost, margins and producers share in the consumer's rupee. Primary data of 2000-01 was used for the study. The main marketing channels were producers, commission agent, wholesales, retailer and consumer. Price spread analysis indicated that the producers received a gross price of Rs 650 per quintal. Share in the consumer's rupee was 45.65%. Marketing cost accounted for 22.80% of consumer's rupee including cost incurred by the farmer and 31.55% of consumer rupee was the marketing margin for intermediaries.

According to Pawar (2007), the agro-climatic conditions of India permit the cultivation of a variety of flowers India is already known for its traditional flower cultivation. Now with the introduction of the centrally sponsored horticulture schemes, commercial cultivation of cut flowers such as roses, orchids, gladiolus, carnation, anthurium, gerbera and lilies, under protected cultivation has become popular. Further he adds that during 2006-07 India produced 0.83 million metric.

Dutta (Mat 5th, 2018) in his paper 'Mullick Ghat: The Flower market by the Ganges' has described how the riveting aura of the flower market has made him believe the myth that he kept listening for years. While experiencing the fanciest street in the flower market he also mentioned about the various kinds of flowers like Marigold, tulips, night jasmine which soothed his eyes and articulated their beauties.

According to Dr. Bandopadhyay and Ghosh (2019) in their paper "A General Analysis of Asia's Largest Flower Market Mullick Ghat Flower Market" found about the infrastructural bottlenecks of a Wholesale market of Kolkata and, she also describes about the current scenario of the Producers, Wholesalers & retailers.

According to Research and Markets.com (2002)-Based on the flower type, the market has been segmented as cut and loose flowers. On the basis of end-user, the market has been segmented as retail and institutional users. On the basis of distribution channel, the market has been segmented as unorganized retail, supermarkets and hypermarkets, florists, online and others. Unorganized retail currently accounts for the highest share of the market. On the basis of application, aesthetic and decorative applications currently account for the highest share. Other applications include flavors and fragrances, natural colours, medicines and others. The regional segmentation of the market has been provided both in terms of production and consumption. Tamil Nadu is currently the largest producer of flowers in India. The competitive landscape of the market has also been examined in the report and the profiles of key players have also been provided.

III. OBJECTIVES OF STUDY

The followings are the main objective of this paper:

1. At Producer's Level

- To explain the status of **production & productivity**.(state wise)
- To analyze the **inter-relationship between the factors of production**. (Area, total production etc.)
- To propose **how the productivity can increase**.

2. At Wholesaler's Level

- To analyze the **relationship between market supply and whole sale price**.
- To know the **variability and consistency of price & supply of different crops and the possible reasons behind them**.
- To analyze the **bottle necks of a standard whole-sale flower market**.
- To analyze the **possible causes of price fluctuation in a calendar year**.

3. Retailer's Level

- To calculate the **price movement**.
- To propose **how they can increase the efficiency of their business**.

4. Consumer's Level

- To know the **main factors which affect the consumer's purchasing nature.**
- To know which is the **main factor for demand fluctuation.**
- To know the **average purchasing capacity of a individual consumer.**
- To know the **overall point of view of the consumers.**
- To collect the **suggestions from the consumer for the betterment of the industry.**

IV. RESEARCH METHODOLOGY

1. Area of the study topic

- **Whole-sale market:** Mullick Ghat Flower Market (Asia's Largest Flower Market)
- **Consumer:** Consumers of Flower Market of Kolkata & Howrah.

2. **Sample size:** I have chosen **30 wholesalers** and **80 consumers** for my study.

3. Sources of data collection

- **Primary data:** This data is especially by using questionnaire collected in 2 types- 1. **Field survey**& 2.**Google forms**. The Data of wholesalers and retailers are collected from field survey and the data of Consumers are collected by using Google Forms.
- **Secondary data:** Secondary data is collected from website of Horticulture Board & Horticulture Statistics at a glance. For the period **2018-2021**.

V. METHOD OF ANALYSIS

In order to carry out the study of the behaviour of the industry, The whole study is bifurcated in main 4 parts **1. Production Scenario 2.Wholesale Market 3. Retail Market 4.Consumer Behaviour(While Purchasing Flowers).** At first we have collect some information from the horticulture statistics at a glance-2019 like production, productivity, land used of all flowers produced in India. In the very beginning of the project work we have shown the overall scenario of flower production, export and productivity. This data will be again used to do some statistical operation using the excel formulas such as **correlation** between the land used and production using. The productivity of flower in West Bengal in respect of the highest and the average productivity are also shown by some charts.

Then in the next wholesales & retail section we have gather the average per month wholesale prices and retail prices with the average arrival (supply) of tree main flowers

1. MARIGOLD, 2.ROSE LOOSE AND 3.TUBE ROSE prevailing in the Kolkata metropolitan from the **National horticulture board website**. This data will be presented in a table and then we do same operation in the producer part except here we will do **regression analysis** between the wholesale prices(y, dependent) and arrival/Supply (x, independent) using excel formulas. Moreover the **Monthly indices** have'en calculated. Beside this some primary perception have been gathered from a standard wholesale flower market- **Mullickghat Flower market (Asia's largest)** to analyze the main bottlenecks faced by the

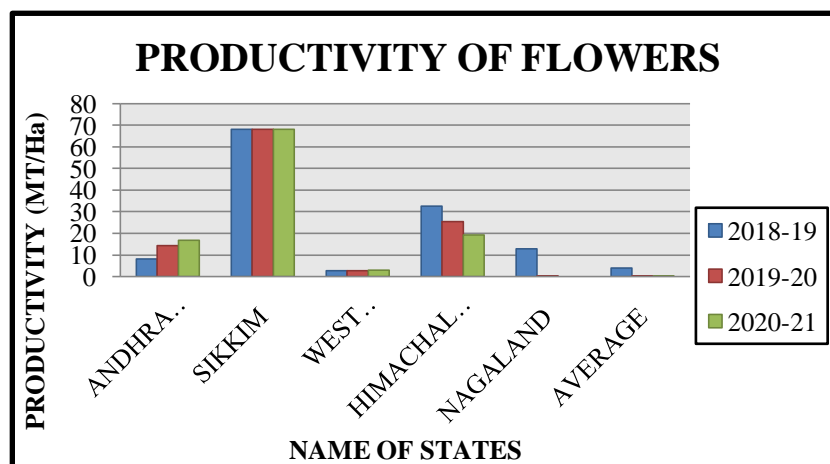
traders in their daily course of business In the next section of retailers, retail prices **contribution & PV ration** will be shown in the table for the **4 years**. Then the same operations like **SD, mean, Coefficient of variation, correlation** between the PV ratio and wholesale prices & at last the **chain based index no** have been calculated to show the price movement of the three crops.

These very steps will be followed in case of other 2 flowers and at last a questionnaire will be distributed randomly but to a single member of a family for collection of responses on various questions related to personal vegetables buying behavior **80 peoples** have filled up the form and these responses will be duly recorded and presented with the help of various charts and graphs.

VI. ANALYSIS

Production and Producer

- 1. State wise productivity of loose flowers (MT/Ha):** Productivity implies the total production/total area employed. This is a measure to see the effectiveness of production in comparative parameter.



See-Table No 22 (Annexure -I) Source: Author's calculation

From the data presented in table no 22 a column chart have been presented to show the highest lowest and fastest growing and fastest declining productivity here from the data we can see Sikkim attains the highest productivity in floriculture sector.

Here we saw Andhra Pradesh is growing very well over three years the possible reason of growths are good climatic condition, proper irrigation facility, skilled farmers, optimum use of fertilizers and pesticides.

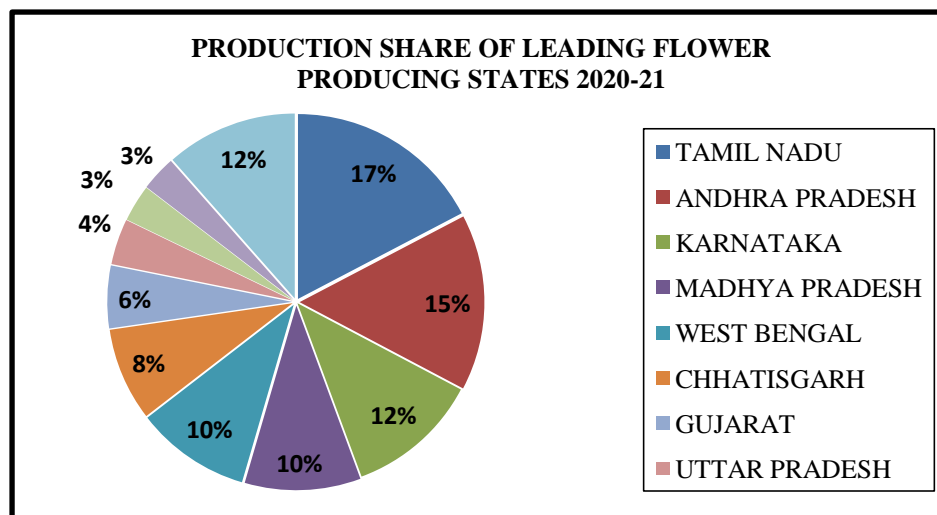
Himachal Pradesh and Nagaland is losing the capacity of growth. According to the PRINTMEDIA Himachal Pradesh's farmers have been traditionally credited with turning the state's rugged mountain valleys into India's best farming hubs, and with bringing in the apple revolution and high-yield cash crops like flowers. But the success story has now rapidly gone downhill as the share of agriculture in Himachal Pradesh's economy has dropped to just 8 per cent in 2020-21, compared to 26.5 per cent in 1992-93.

Large tracts of fertile land have been abandoned by farmers in the state for being uneconomical.

One of the most important reasons behind this decline is - **It's a reflection on farmers shifting to alternate means of livelihood and also migrating to urban towns. The younger generations are particularly uninterested in taking up agriculture-related activities, and are on the look-out for government jobs or contractual salaries.**

Here the data of West Bengal also have been presented the growth in West Bengal floriculture sector is more than the average growth of the country but is not as much desirable the govt should take initiative for the optimum growth of flower cultivation.

2. **Production share of leading flower producing states 2020-2021:** From the data presented in table no 23 (Annexure 1) we have prepared a pie chart to show the all over production scenario.



See-Table No 23 (Annexure -I) Source: Author's calculation

Here we can see that the high productivity does not signifies the greater share in production, Tamil Nadu got the first position in flower production & West Bengal holds the fourth position but West Bengal can increase its production more – but the main bottle necks faced by the Florists of West Bengal are – *According to various newspapers and journals*

- Lack of Funding
- lack of research and development initiatives
- Bleak monsoon.
- Lack of govt initiatives. etc.

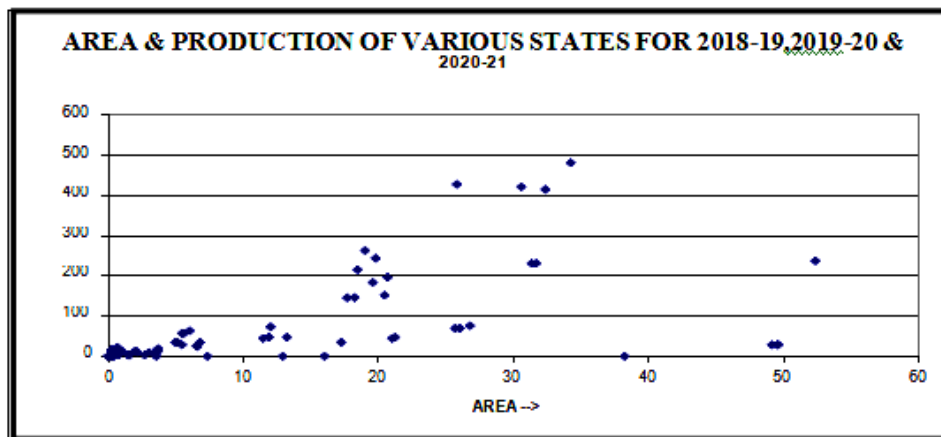
3. **Relationship of area and production from state wise data for three years 2018-19, 2019-20 and 2020-21:** we know area is one of the most important factor for increasing production so here I have judged the relationship of these two variables to know how the production will increase.

We have got the statistics about the aggregate area & production for the year 2018-19, 2019-20 & 2020-21. Now to judge the strength of association of area & production I have used correlation technique and I have observed the certain things. For the purpose of calculation X axis is taken for Area of production of 3 years & (independent variable) Y axis is taken for production of 3 years (dependent variable).

Correlation: Correlation, in the finance and investment industries, is a statistic that measures the degree to which two securities move in relation to each other. Correlations are used in advanced portfolio management, computed as the correlation coefficient, which has a value that must fall between -1.0 and +1.0.

Formula used- $n \sum d_x d_y - (\sum d_x)(\sum d_y) / \sqrt{n \sum d_x^2 - (\sum d_x)^2} \cdot \sqrt{n \sum d_y^2 - (\sum d_y)^2}$ where $d_x = X - A$ and $d_y = Y - B$ where A, B are assumed mean of X & Y .

The above data is collected from-Horticulture statistics at a glance 2021.



See-Table No 24 (Annexure -I) Source: Author's calculation

Correlation Co-Efficient	0.587191583
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Here we saw the value of correlation is more than 0.5 but less than 1 so we can say that – **there is a positive correlation between area and production.** But the value of correlation co-efficient is near to 0.5 so it is **MODERATELY CORRELATED.**

So we observe might be area is not the only factor for increasing production. Irrigation facility, fertilizers, climatic positions are also important factor for increasing the production, but we should also say that area is also an important factor at all.

4. Other important factors of flower production

Table 3: Estimated Irrigated and UN Irrigated Area by Size of Operational Holdings under Floriculture

Social Group: All social group area (in hectares)

Sl. No.	Size Class (in Ha.)	TOTAL FLORICULTURE (1699)			
		No. of Holdings	Irrigated Area	Unirrigated Area	Total
1	Below 0.5	720738	13465.33	3574.74	17040.07
2	(0.5-1.0)	78971	13169.12	3602.10	16771.22
	Marginal	799709	26634.45	7176.84	33811.29
3	(1.0-2.0)	58196	17151.32	5636.92	22788.24
	Small	58196	17151.32	5636.92	22788.24
4	(2.0-3.0)	20816	8254.86	3272.17	11527.03
5	(3.0-4.0)	7677	3891.86	1673.07	5564.93
	Semi-Medium	28493	12146.72	4945.24	17091.96
6	(4.0-5.0)	4227	2287.64	1382.74	3670.38
7	(5.0-7.5)	3888	2524.87	1503.61	4028.48
8	(7.5-10.0)	1246	834.10	813.07	1647.17
	Medium	9361	5646.61	3699.42	9346.03
9	(10.0-20.0)	1014	562.87	666.23	1229.10
10	20 & Above	304	737.42	266.63	1004.05
	Large	1318	1300.29	932.86	2233.15
11	All Classes	897077	62879.39	22391.28	85270.67

Source: Agriculture Census 2020-21

Table 4: Consumption of fertilizers for flowers

Sl. No.	CROP	Gross Cropped Area (in ha.)			Area Treated with Chemical Fertilizer (In (ha.))		Area Treated with: (in ha.)					
		Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total	FYM	Oil Cakes	Other Organic Manures	Pesticides	Green Manure
1	Orchids	277	1464	1741	0	0	0	72	0	0	64	0
2	Rose	2813	25	2838	2498	3	2501	1067	43	130	1452	0
3	Carnation	0	0	0	0	0	0	0	0	0	0	0
4	Marigold	3007	903	3910	2027	880	2907	1684	0	209	2304	0
5	Jasmine	11480	593	12073	10397	556	10953	6339	7	12	9385	412
6	Chrysanthemum	3537	89	3626	3234	89	3323	1412	176	0	958	36
7	Gladiolus	0	29	29	0	28	28	1	0	0	28	0
8	Tuberose	1344	91	1435	1178	0	1178	967	0	0	882	67
9	Gerbera	329	0	329	329	0	329	0	0	0	329	0
10	Glaridiya	0	0	0	0	0	0	0	0	0	0	0
11	Other Flowers	32897	10719	43616	27846	964	28810	13181	1929	934	26079	948
	Total Floriculture	55774	13916	69690	47564	2520	50084	24741	2155	1300	41527	1463

Source: Agriculture Census 2020-21

Wholesale Market: For the second part of the analysis I have chosen Asia's Largest Flower Market – **Mullick Ghat Flower Market**, as my sample area of study beside that I have taken the help of the website of NATIONAL HORTICULTURE BOARD, from there I have got the aggregate supply and the wholesale price of **Center- Kolkata**, for the period jan2016-dec 2019 and with the help of that, I have done several statistics to judge the wholesale market structure of Kolkata.

5. Variability and consistency of price & supply: There are various types of flowers are being traded in the markets of Kolkata, for my study purpose I have chosen 3 flowers crops-

- **Marigold**
- **Rose loose**
- **Tube Rose**

Method used: For judging the variability and consistency of price and Supply we have used the popular technique of dispersion i.e Standard Deviation and Co-efficient of variation-

Standard deviation: a quantity expressing by how much the members of a group differ from the mean value for the group.

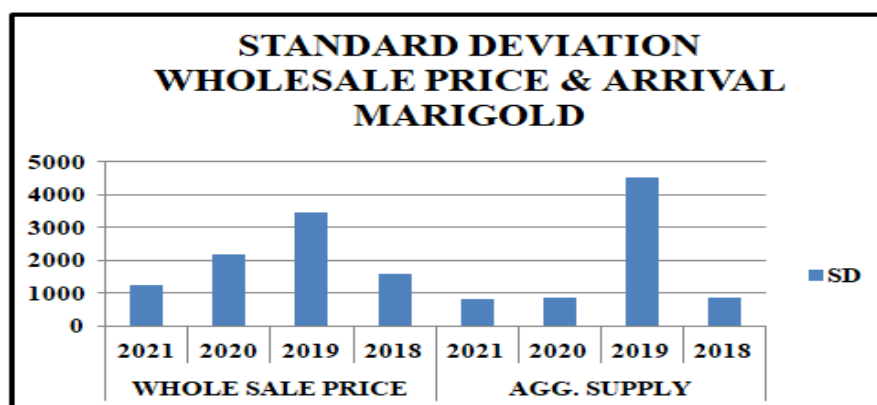
Formula: $SD = \sigma = \sqrt{\sum X^2/N - (\sum X/N)^2}$ OR $\sqrt{\sum d^2/N - (\sum d/N)^2}$ where $d = x - A$ ($A =$ assumed mean)

COV: The coefficient of variation (CV) is the ratio of the standard deviation to the mean. The higher the coefficient of variation, the greater the level of dispersion around the the mean. It is generally expressed as a percentage. Without units, it allows for comparison between distributions of values whose scales of measurement are not comparable.

Formula: COV- SD/MEAN

Table 5: Marigold (supply in MT and Price/Qt)

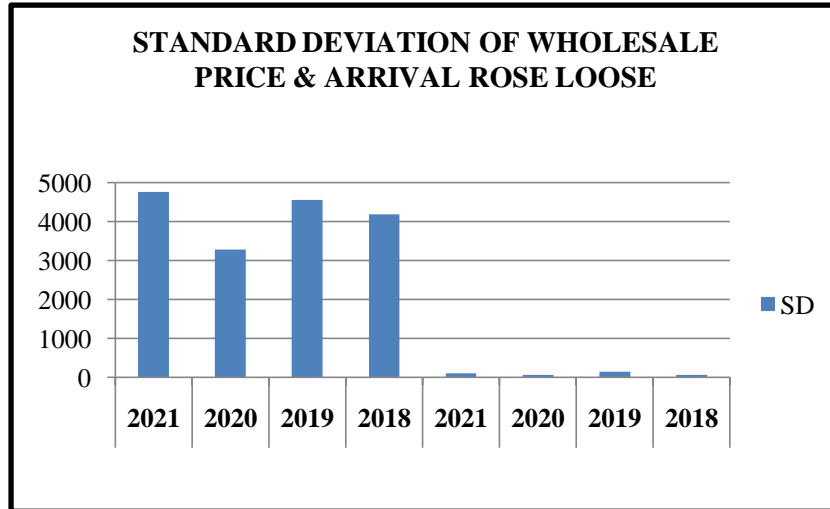
Measures of Dispersion	Whole Sale Price				Agg. Supply			
	2021	2020	2019	2018	2021	2020	2019	2018
SD	1219.999578	2187.679986	3453.218634	1598.179	813.33	862.9229	4518.873	840.7634
COV	0.238965705	0.522566233	0.672519331	0.376655	0.2048	0.225906	1.01872	0.274699



See-Table No 25 (Annexure -I)Source: Author's calculation

Table 6: ROSE LOOSE (Supply in MT and Price/Qt)

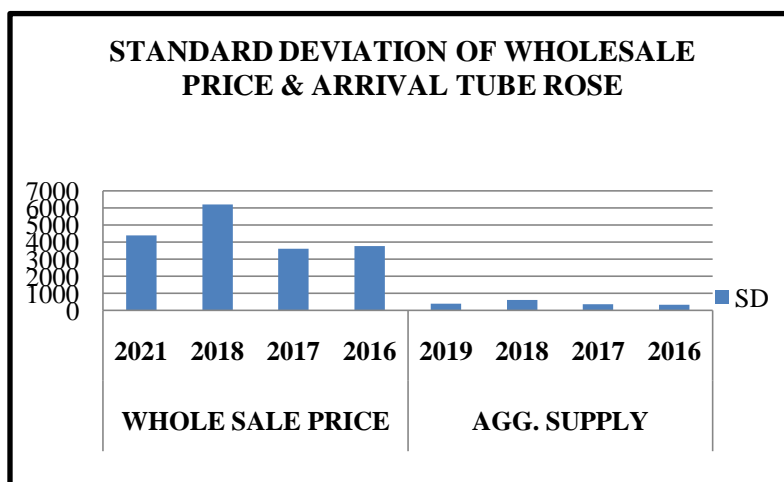
Measures of Dispersion	Whole Sale Price				Agg. Supply			
	2021	2020	2019	2018	2021	2020	2019	2018
SD	4761.771319	3283.35387	4555.90135	4189.979	108.17	73.10267	155.5685	68.61398
COV	0.222684374	0.249637245	0.362262308	0.404826	0.3834	0.253829	0.406715	0.193098



See-Table No 26 (Annexure -I) Source: Author’s calculation

Table 7: TUBE ROSE (supply in MT and Price/Qt)

Measures of Dispersion	Whole Sale Price				Agg. Supply			
	2021	2018	2017	2016	2019	2018	2017	2016
SD	4387.339171	6179.680719	3601.1264	3756.934	374.75	602.003	332.5564	304.4928
COV	0.536447903	0.545964459	0.3432777	0.398638	0.156	0.321068	0.286893	0.288164



See-Table No 27(Annexure -I) Source: Author’s calculation

Here we can observe if the standard deviation of any data set of any year is high then the COV is also high as the general rule of dispersion. Lower COV indicates the greater

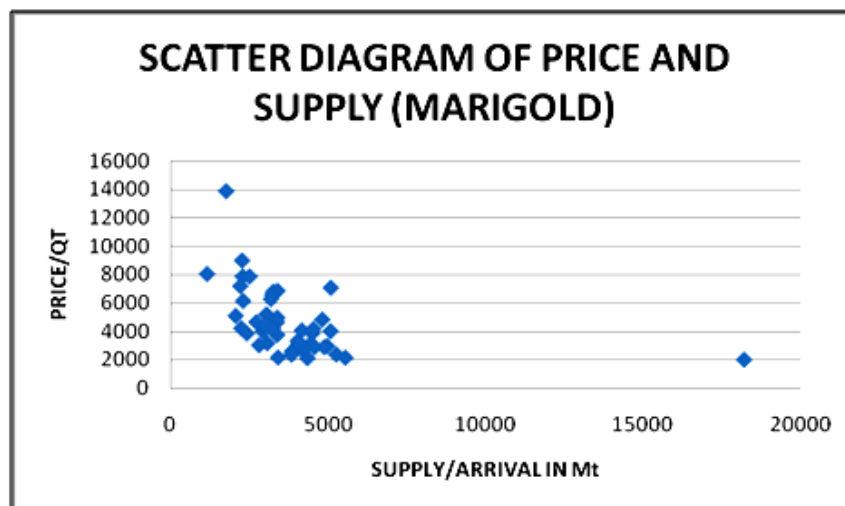
consistency of any data set. Again we can say that the variability and consistency of price and supply are fluctuating over the years.

6. Relationship between price and supply: From the data presented in table no-25-27ANNEXURE-I have done the calculation of correlation to judge the strength of association of price & supply. For the calculation purpose we have Chosen X axis for Wholesale supply of 48 months (2018Jan-2021Dec) & the Y axis is chosen by me for the purpose of Whole sale price of 24 months (2018Jan-2021Dec).

Correlation: Correlation, in the finance and investment industries, is a statistic that measures the degree to which two securities move in relation to each other. Correlations are used in advanced portfolio management, computed as the correlation coefficient, which has a value that must fall between -1.0 and +1.0.

Formula used: $n\sum d_x d_y - (\sum d_x)(\sum d_y) / \sqrt{n\sum d_x^2 - (\sum d_x)^2} \cdot \sqrt{n\sum d_y^2 - (\sum d_y)^2}$ where $d_x = X - A$ and $d_y = Y - B$ where A, B are assumed mean of X&Y.

Marigold



See-Table No 25 (Annexure -I) Source: Author's calculation

Correlation Coefficient	-0.41156
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Here we saw the value of correlation is less than 0 but more than -1 so we can say that – **there is a negative correlation between Supply &Price** But the value of correlation co-efficient is near to -0.5 so it is **MODERATELY NEGATIVE**.

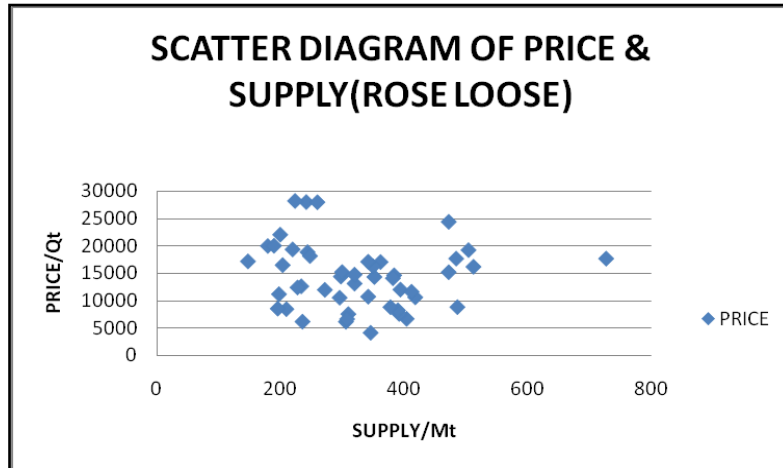
For the further analysis we have gone through the Regression Analysis of the Data set.

Intercept	6173.92
Slope	-0.039418
Straight Line Equation.	Y= 6173.92-0.039418X

See-Table No 25 (Annexure -I) Source: Author's Calculation

From the detail analysis stated in table no 7 we can't accept the null hypothesis as the value of P Statistics is lower than 0.05 and we also reject the null hypothesis as the value of observed f is Higher than the Significance F.

Rose Loose



See-Table No 26 (Annexure -I) Source: Author's Calculation

Correlation Coefficient	-0.1023
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Here we saw the value of correlation is less than 1 but more than -1 so we can say that – **there is a negative correlation between Supply &Price** . But the value of correlation co-efficient is near to 0 i.e. origins so it is **SLIDE NEGATIVE**

For the further analysis we have gone through the Regression Analysis of the Data set.

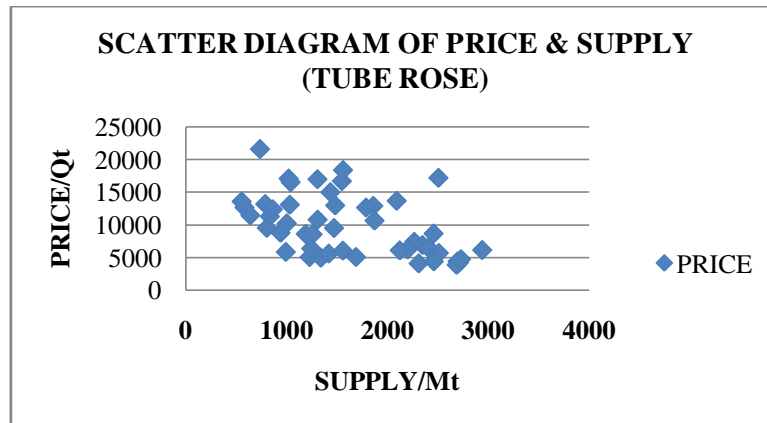
Intercept	16117.28
Slope	-0.535687
Straight Line Equation	Y=16117.28- 0.535687x

See-Table No 26 (Annexure -I)Source: Author's Calculation

From the detail analysis stated in table no 8 we can accept the null hypothesis as the value of P Statistics is lower than 0.05 and we also accept the null hypothesis as the value of Significance f is Higher than the observed F.

So we observe, there is **ainverse relationship between Supply and price**. So if the supply increases then the price will fall a little & if the supply decreases then the price will increase a little, according to the analysis. The increased supply leads a reduction in price level.

Tube Rose



See-Table No 27 (Annexure -I) Source: Author’s Calculation

Here we saw the value of correlation is less than 1 but more than -1 so we can say that **there is a negative correlation between Supply & Price (as we observe in law of supply)**. But the value of correlation co-efficient is near to -0.5 so it is **MODERATELY NEGATIVE**.

For the further analysis we have gone through the Regression Analysis of the Data set.

Intercept	15186.3
Slope	-3.28571
Straight Line Equation	Y=15186.3- 0.328571x

See-Table No 27 (Annexure –I) Source: Author’s Calculation

From the detail analysis stated in table no 9 we can’t accept the null hypothesis as the value of P Statistics is lower than 0.05 and we also reject the null hypothesis as the value of observed f is Higher than the Significance F.

Assumption- The arrival of the crops = Supply of the crops.

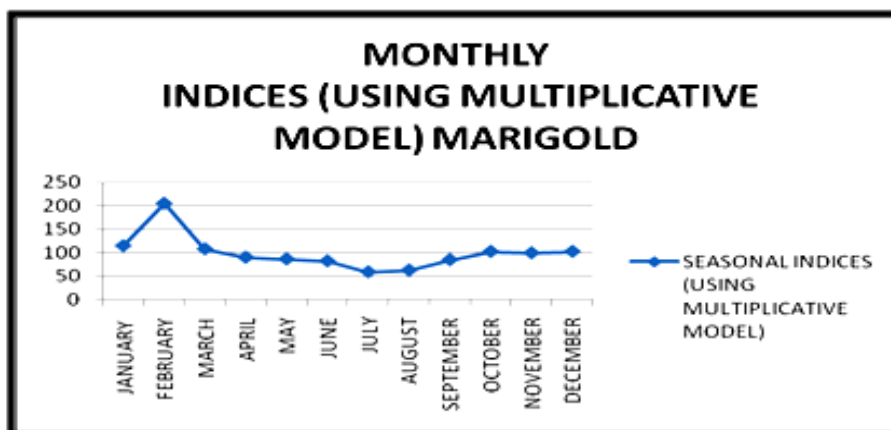
7. Calculation of monthly indices (from monthly arrival/supply of crops): According to the time series analysis technique we have analyse the monthly indices using simple average method. The following steps have been adhered for calculation-

- **Step1:** First of all we have taken the monthly arrivals of the crops for the period 2018-19.
- **Step2:** Then we have calculated the mean of the monthly arrivals (i.e average of arrivals of January 2018- January2021)
- **Step3:** Then we have calculated the Grand Average using the monthly averages.
- **Step4:** Then the monthly indices have been calculated using the formula –

$$SI= \text{Monthly average/grand average} *100$$

Table 8: Marigold (Arrival in Tons)

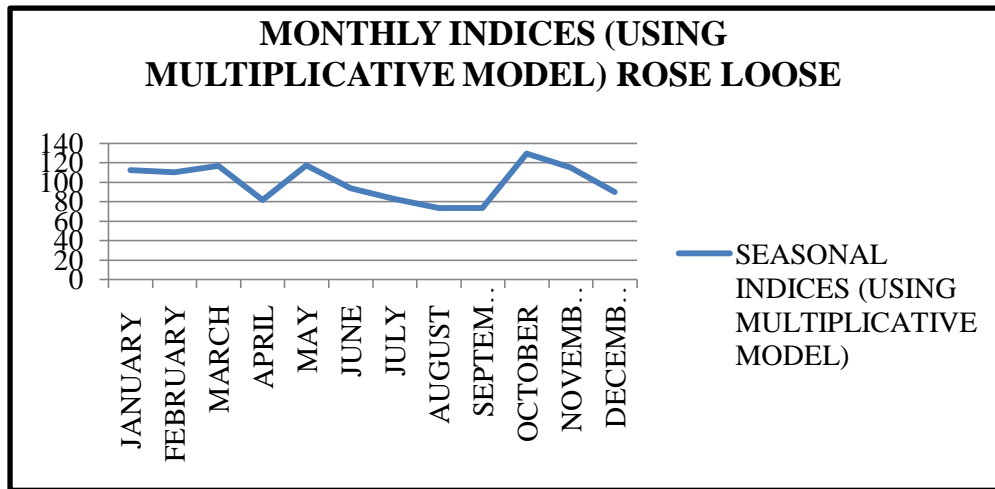
Month	2021	2020	2019	2018	Average of Monthly Arrivals.	Grand Average of Arrival	Monthly Indices (Using Multiplicative Model)-I
January	5090	3058	5274	4154	4394	3821.916667	115
February	4510	4280	18210	4470	7868	3821.916667	206
March	3276	4980	5560	2734	4138	3821.916667	108
April	3394	3868	3428	3084	3444	3821.916667	90.1
May	3028	3856	3396	2944	3306	3821.916667	86.5
June	3258	4066	2436	2824	3146	3821.916667	82.3
July	3240	2524	1176	2082	2256	3821.916667	59
August	3200	2284	1780	2318	2396	3821.916667	62.7
September	4180	3402	3154	2260	3249	3821.916667	85
October	5100	4890	3410	2308	3927	3821.916667	103
November	4830	4050	3178	3192	3813	3821.916667	99.8
December	4550	4580	2228	4358	3929	3821.916667	103
							$\Sigma I-1200$



See-Table No 25 (Annexure –I) Source: Author's Calculation

Table 9: Rose Loose (Arrival in Tons)

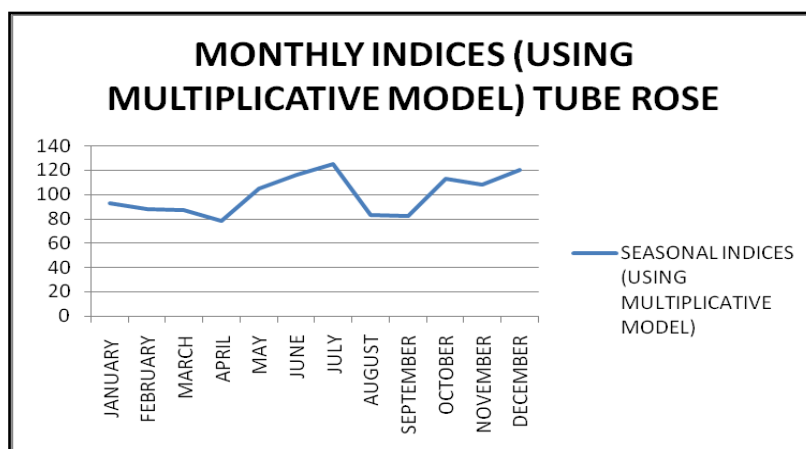
Month	2021	2020	2019	2018	Average of Months	Grand Average	Seasonal Indices (Using Multiplicative Model)-I
January	342	300	412	418	368	327	113
February	242	244	484	472	360.5	327	110
March	320	320	486	404	382.5	327	117
April	204	272	390	210	269	327	82.3
May	504	342	384	306	384	327	117
June	200	378	308	346	308	327	94.2
July	248	296	236	310	272.5	327	83.3
August	180	196	198	392	241.5	327	73.9
September	190	148	234	394	241.5	327	73.9
October	472	350	512	362	424	327	130
November	260	228	726	298	378	327	116
December	224	382	220	352	294.5	327	90.1
							$\Sigma I-1200$



See-Table No 26 (Annexure –I) Source: Author’s Calculation

Table 10: Tube Rose (Arrival in Tons)

Month	2021	2020	2019	2018	Average of Months	Grand Average	Seasonal Indices (Using Multiplicative Model) -I
January	2942	1042	1472	584	1510	1623.166667	93
February	2710	738	1484	790	1430.5	1623.166667	88.1
March	1874	1550	1310	942	1419	1623.166667	87.4
April	2202	1436	806	642	1271.5	1623.166667	78.3
May	2124	2268	1420	994	1701.5	1623.166667	105
June	2698	2350	1246	1230	1881	1623.166667	116
July	2688	2406	1690	1342	2031.5	1623.166667	125
August	1790	1862	556	1192	1350	1623.166667	83.2
September	2094	1562	866	836	1339.5	1623.166667	82.5
October	2508	2512	1022	1308	1837.5	1623.166667	113
November	2460	2312	1004	1260	1759	1623.166667	108
December	2732	2462	1034	1560	1947	1623.166667	120
							ΣI -1200



See-Table No 27 (Annexure –I) Source: Author’s Calculation

Here if we consider the arrival=demand for crops then we can see the type of crop manipulates the demand schedule i.e some flower have high demand in some particular month,

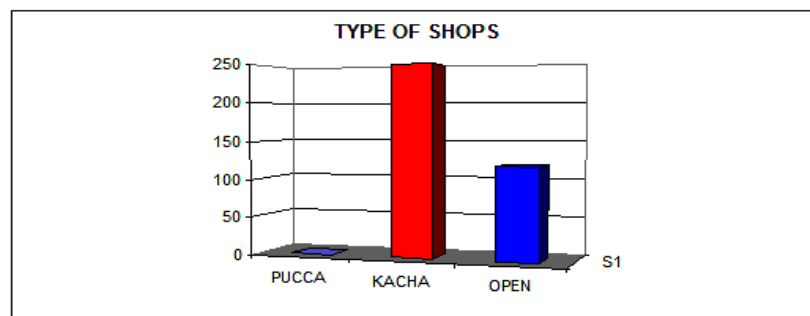
Socio Economic Position of Standard Wholesale Market- Mullick Ghat Flower Market

8. Position of the shops

Table 11: Position of Shops

Type of Shop	No of Shops
Pucca	0
Kacha	250
Open	120

Data source: Agriculture market directoty market survey report 2020-21



(Source: Author's caculation)

From the above data we have seen that the most number of shops are Kacha in nature and the no of Pucca shops are 0 moreover there are a large no of open shops. For this reason the Vendors and Customers faced too much trouble in the time of RAINY SEASON moreover – the flowers get damaged for improper placing and for that marginal vendors have a loss in their day to day trading.

9. Other important facts (Facilities and services)

Table 12

Facilities & Services	Yes/No	Facilities & Services	Yes/No
Bank	Yes	Agril Input Shop	No
Sundry Shop	No	Electricity	Yes
P.O.	Yes	Drinking Water	Yes
Canteen	Yes	Shed Of Animals	No
Farmer's Dormitory	Yes	Water Through	No
Weight Bridge	Yes	Loading Platform	Yes
Agri Clinic	No	Extension Space	Yes
Grading Equipment	No	Parking	Yes
Toilet	Yes (Ladies)	Market Building	Yes
Sweeping Cleaning	Yes	Shopping Mall	No
Water Logging	Yes	Waste Box	Yes
Auction Platform	No	Cold Store(In 5km)	No

Data Source: Agriculture market directory market survey report 2020-21

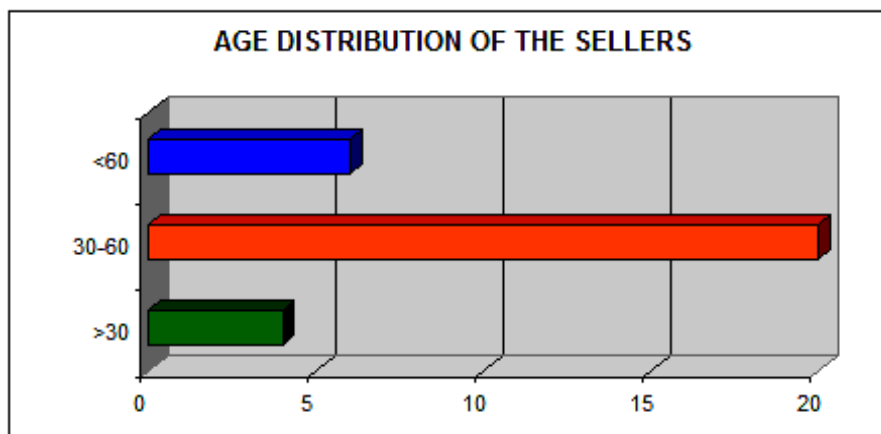
Table 13

Nearest	Name	Use For Inflow/Outflow
District H.Q.	Kolkata(2km)	----
Rly Station	Barabazar(1 Km)	No
Bus Stop	Barabazar(0.80 Km)	----
Pucca Road	Strand Road(0.80km)	Yes
Nh/Sh	Sh 1(10 Km)	Yes
Ferry Ghat	Fairly	Yes
Arrival Modes- Other, Thela, Boat		
Despatch Mode- Other, Van, Auto, Cycle, Minidoor		

Data Source: Agriculture market directory market survey report 2020-21

From the data presented above the main things that we can see is, there are some important things not present in the market place. According to my perception there should be a **AGRI CLINIC**, and another important thing is the facility of cold storage. **Cold chain system** is one of the most important factor in agriculture based market place, to keep the materials fresh and well as they are perishable in nature.

10. Age Distribution of the Sellers



Source: Author's calculation

See-Table No 14 (Annexure –I)

Table 14

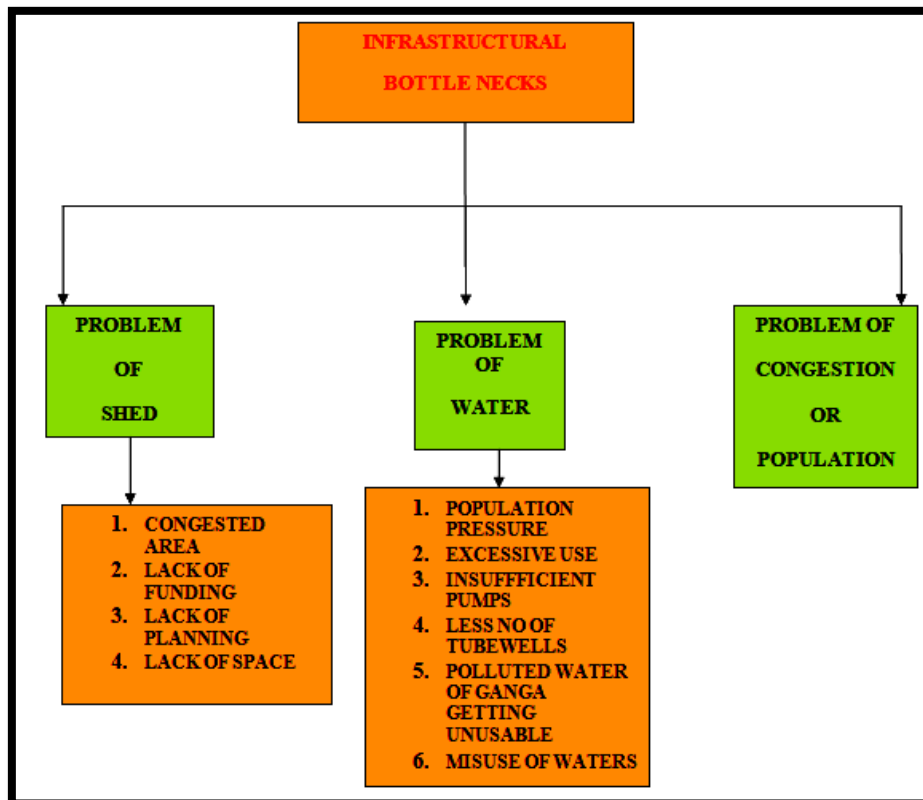
Age Group	No of People
>30	4
30-60	20
<60	6
Total	60

Data Source: Own Sample Study

From the above data we have seen that the most number of people sellers belongs to the second age group of 30-60 years. So we can observe that the no of new comers or

young people are less in no, and the no of old aged people are also small in no- So we can say the industry needed a good amount of strength and power.

11. Problem faced by the sellers in day to day business activity: Mullickghat Flower Market Is Asia's Largest Floral Market And It Is The Central Trading center of flowers in Eastern India, in spite of that the market is facing various issues the planning of the market structure is not desirable as much the following bottle necks are faced by the traders in their day to day business activity.



From the above data we can see the bottlenecks of the traders in their day to day course of action. The shed problem is one of the biggest problems in their activity in the Rainy season the problem gets unbearable; the buyers face too much problem in the market.

(More data can be collected from this market place but for the Covid-19 pandemic the data of the standard wholesale market have been collected up to this)

Retail Market

12. Relation among wholesale price, retail price and contribution earned by the retailers: as like the previous part of the analysis I have taken 3 flowers as my area of study, and now I want to know the relationship between the cost, sales and contribution from the data I have collected. Here we know wholesale price is the cost in the hands of the retailer, and we also know that the retail price is the sales in hands of the retailer. Moreover we can calculate the contribution (**SALES-VARIABLE COST**) and profit

volume ratio (**CONTRIBUTION/SALES*100**) from these two data. know I will calculate the relationship or *strength of association* among Sales, variable cost, and contribution and p/v ratio.

Table 15: Marigold (All The Cost Are/Qt)

Correlation Between V. Cost(X) Contribution Amount(Y).	0.745449958
Correlation Between V. Cost (X) And P/V Ratio.	-0.49512
Correlation Between Cost(X) And Sales(Y)	0.987589564

See-Table No 31 (Annexure –I) Source: Author's Calculation

Table 16: Rose Loose (All the Cost are/Qt)

Correlation Between V. Cost(X) And Contribution Amount(Y).	0.915585303
Correlation Between V.Cost(X) And P/V Ratio.	-0.72282
Correlation Between Cost(X) And Sales(Y)	0.996238956

See-Table No 32 (Annexure –I) Source-Author's Calculation

Table 17: Tube Rose (All the Cost are/Qt)

Correlation Between V. Cost(X) And Contribution Amount(Y).	0.813633837
Correlation Between V. Cost (X) And P/V Ratio.	-0.60582
Correlation Between Cost(X) And Sales(Y)	0.989803696

See-Table No 33 (Annexure –I) Source: Author's Calculation

From the data presented above the main things that we can see is, the Cost and contribution amount is **Positively correlated** in every cases it means if the amount of cost increases then the amount of contribution will also increase and vice versa, But from the analysis we can also see that, the variable cost and profit volume ratio is **Negatively correlated**. It implies with increasing cost, **the amount of profit will increase but the % of profit will decrease**. So we can say that the retailers are always concerned about amount of profit but they are not concerned about the % of profit.

Assumption: Here we assume there are no other variable costs in the hands of the retailer.

13. Index no analysis (using retail prices): An Index Number Is the Measure of Change in a Variable (Or Group of variables) over time. It is typically used in economics to measure trends in a wide variety of areas. Index numbers are one of the most used statistical tools in economics.

Index numbers are not directly measurable, but represent general, relative changes. They are typically expressed as percents

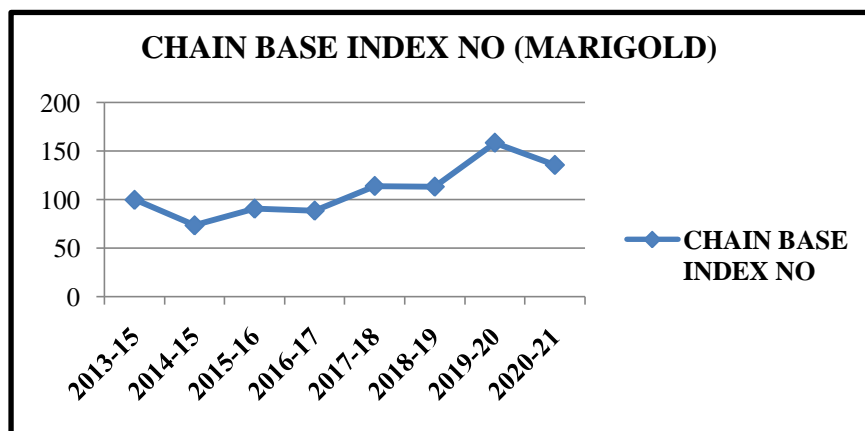
Formula Used-

Link Relatives = Price of the Year/Price of Prev Year *100

Chain Base Index of Any Year-Link Index of the Year*Chain Base Index of Prev Year/100.

Table 18: Marigolds (Price/QT)

Year	Average Retail Price	Link Relatives	Chain Base Index No
2013-15	4639	100	100.00
2014-15	3422	73.77	73.77
2015-16	4220	123.32	90.97
2016-17	4125	97.75	88.92
2017-18	5301	128.51	114.27
2018-19	5268	99.38	113.56
2019-20	7364	139.79	158.74
2020-21	6304	85.61	135.89

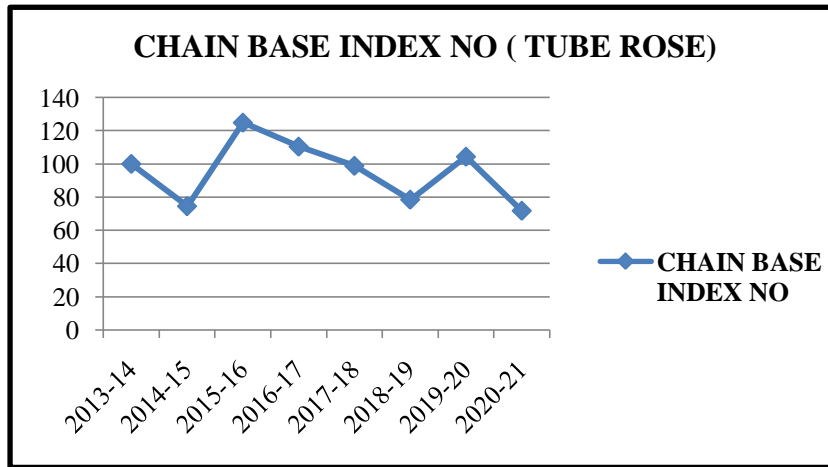


See-Table No 34 (Annexure –I) Source: Author's Calculation

From the data presented above we can see that, the price have a increasing trend. In 2019-20 the price is at the peak level. The price has a slide decrease in the year 2020-21 w.r.t 2019-20. From the above table we can see the price movement of last 8 years.

Table 19: Tube Rose (Price/QT)

Year	Average Retail Price	Link Relatives	Chain Base Index No
2013-14	16666	100	100.00
2014-15	12409	74.46	74.46
2015-16	20813	167.73	124.88
2016-17	18402	88.42	110.42
2017-18	16467	89.48	98.81
2018-19	13067	79.35	78.41
2019-20	17388	133.07	104.33
2020-21	11953	68.74	71.72

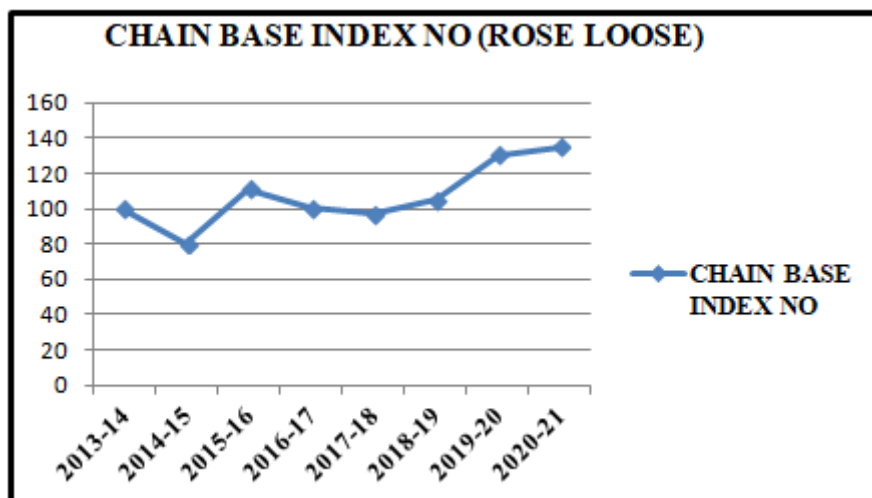


See-Table No 35 (Annexure –I) Source: Author’s Calculation

From the data presented above we can see that, the price havea increasing trend. In 2015-16 the price is at the peak level. The price has a decrease in the year 2020-21 w.r.t 2019-20. From the above table we can see the price movement of last 8 years.

Table 20: Rose Loose (Price/QT)

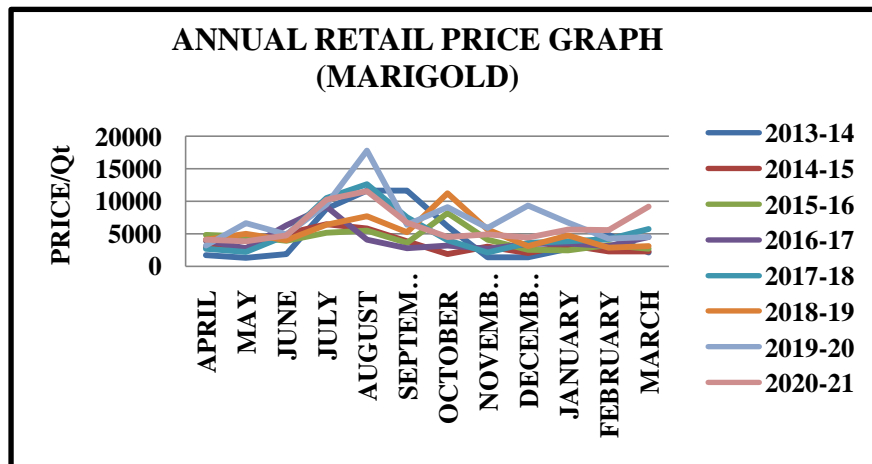
Year	Average Retail Price	Link Relatives	Chain Base Index No
2013-14	14041	100	100.00
2014-15	11269	80.26	80.26
2015-16	15627	138.67	111.30
2016-17	14152	90.56	100.79
2017-18	13611	96.18	96.94
2018-19	14727	108.20	104.89
2019-20	18333	124.49	130.57
2020-21	18939	103.31	134.88



See-Table No 36 (Annexure –I) Source: Author’s Calculation

From the data presented above we can see that, the price havea increasing trend. In 2020-21 the price is at the peak level. From the above table we can see the price movement of last 8 years.

14. Yearly movement of price: From the data presented in table no 34-36 I have prepared a Graphical trend-line of price, from this analysis we can observe the point of price hikes, And from the pre field survey I will Try to find out the causes of price hikes.



See-Table No 34 (Annexure –I) Source: Author’s Calculation

Over the years we can observe there is a price hike in the time of autumn (September -October). The main reason of this price hike is Durga Puja one of the biggest festival in Kolkata. Another reason of price hike is shortage of production. As Marigold grow well in the time of Winter so in the beginning of the summer there is a extreme price hike, If the production of this flower is enough then there will be no price hike in the beginning of the summer.

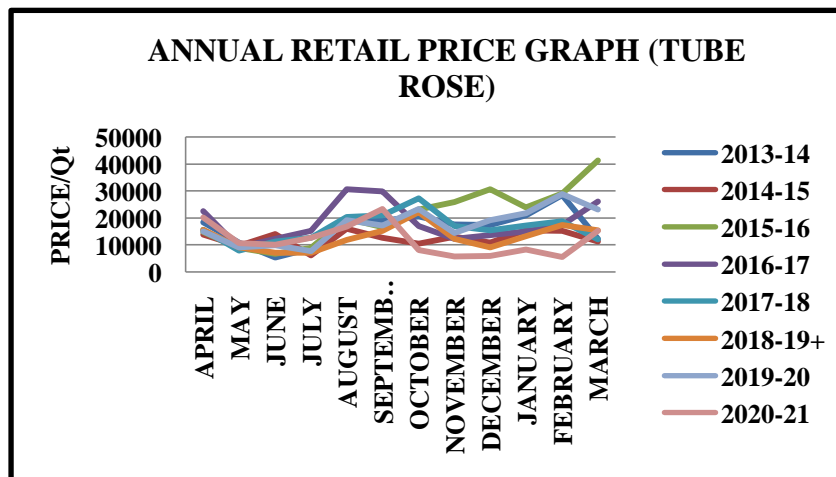
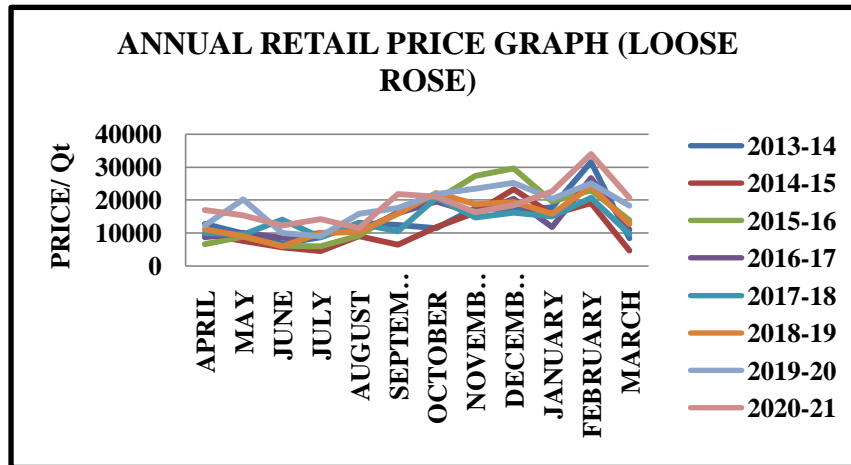


Figure 20:

See-Table No 35 (Annexure –I) Source: Author’s Calculation

Over the years we can observe there is a price hike in the time of autumn (September-October). The main reason of this price hike is Durga Puja one of the biggest festival in Kolkata. Another reason of price hike is the demand in wedding seasons.



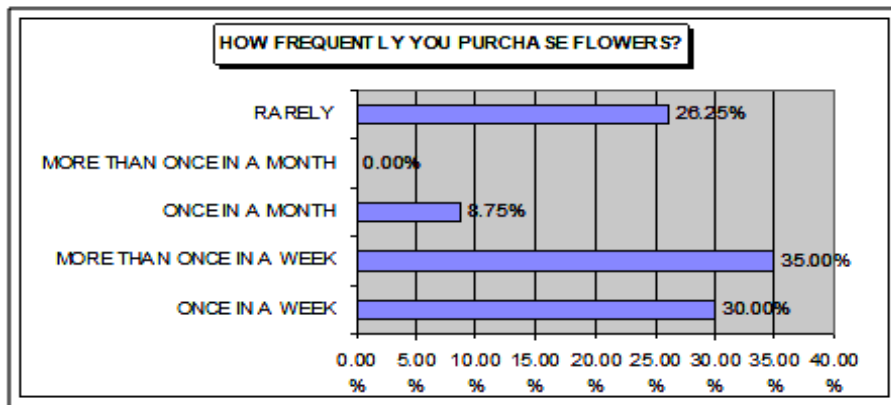
See-Table No 36(Annexure –I) Source: Author's Calculation

Over the years we can observe that the fluctuations of price are not as much in comparison with MARIGOLD. The main points of price hikes are February and there is a steady increase of price in the months of September- December. According to my perception and pre-field study the main reasons of price hike in the time of February is – Saraswati puja, Valentine's Day etc, and in the time of September- December the main reasons of price hike is Wedding seasons, and ceremonial demand.

Observation: So we observe the festive demand is one of the main cause or major factor for increasing the price. The factors of price hike can be categorized as-

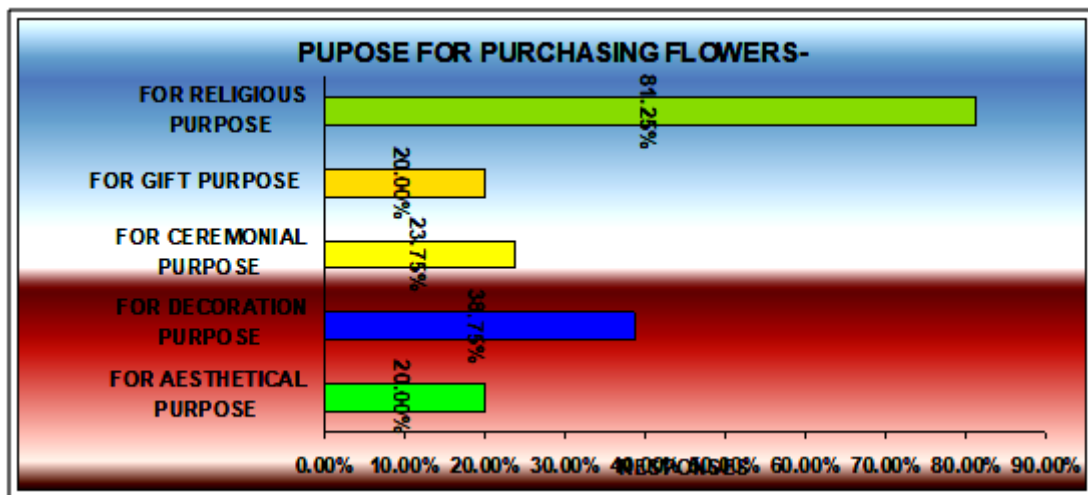
- Shortage of production
- change in weather
- Unpredictable rainfall
- High Demand in wedding seasons.
- High Demand in the time of Special puja.

Consumer behavior: After analyzing the perception of producers, retailers and wholesalers. I have taken the opinion of **80 Consumers** about their behaviour while purchasing the Flowers. The data is collected through **Google forms**.



(Source: Author's Calculation)

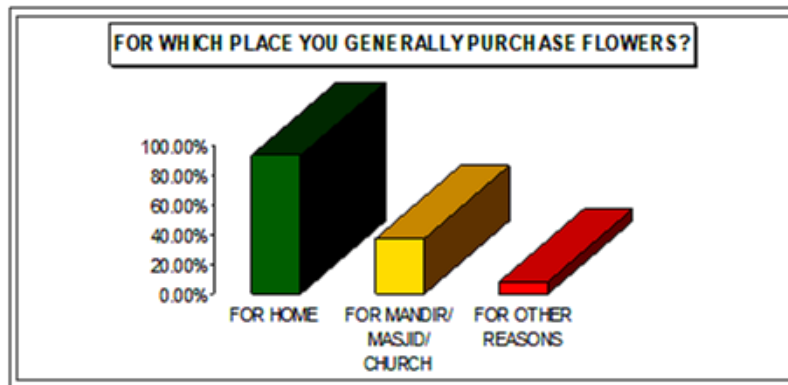
From the data presented above we can clearly say that no's no of people purchase flowers in weekly manner.



(Source: Author's Calculation)

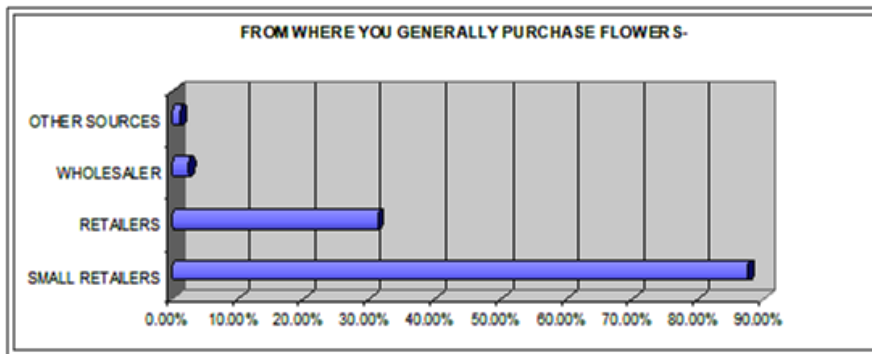
From the data presented above Religious traditions are the main reason for purchasing flowers of the consumers, as India follows the traditions and customs in the religious aspect. We can elaborate it in the following manner.

The flowers like **Dhutra, Akanda**, (local name) neither have the fragrance nor the beauty as like the other flowers, but these are only used by the people as the Hinduism have a old tradition of worshipping Lord Shiva with the above said flowers. So we can say the most no of people purchase flowers for religious belief, and there are lot more examples lying in the society.



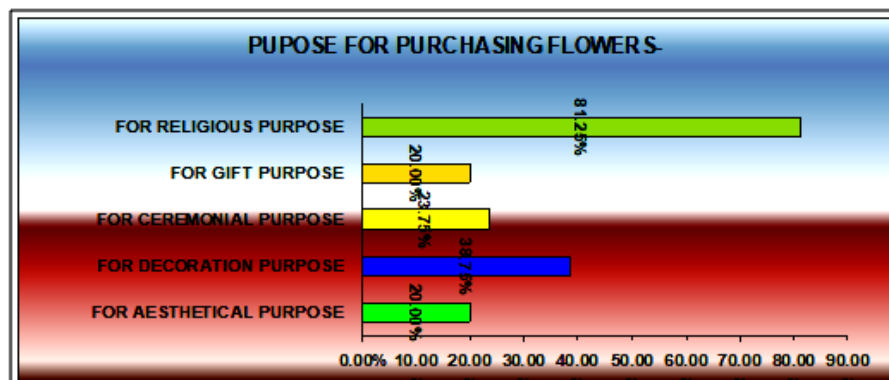
(Source: Author's Caculation)

From the data presented above the most know of people purchase the flowers for their home, very often they purchase the flowers for Mandir, Masjid or Church, people often purchase the flowers for other places like their business houses etc.



(Source: Author's Caculation)

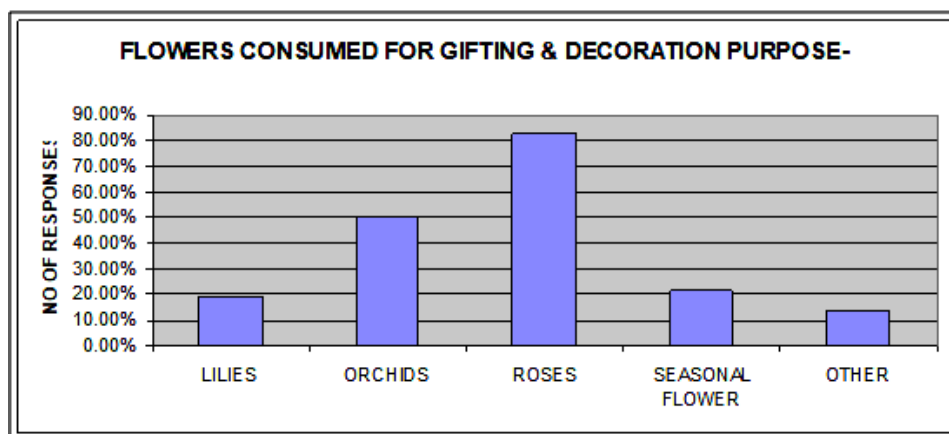
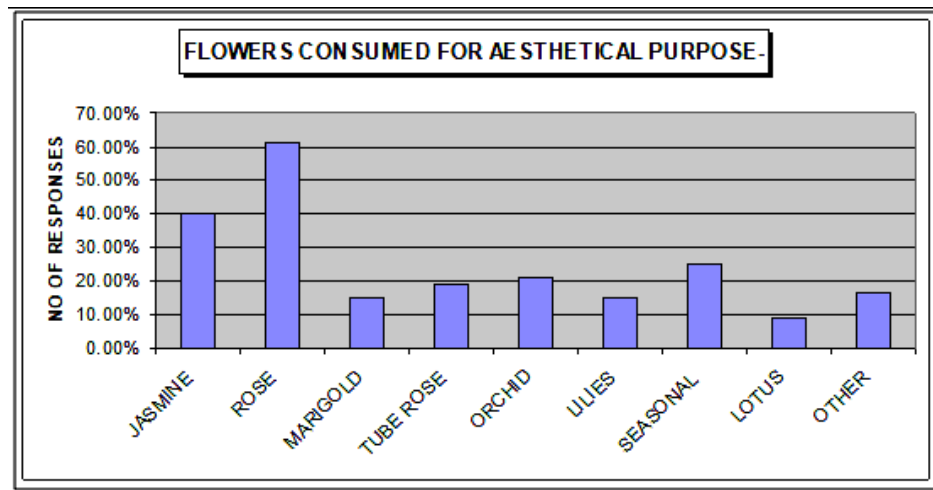
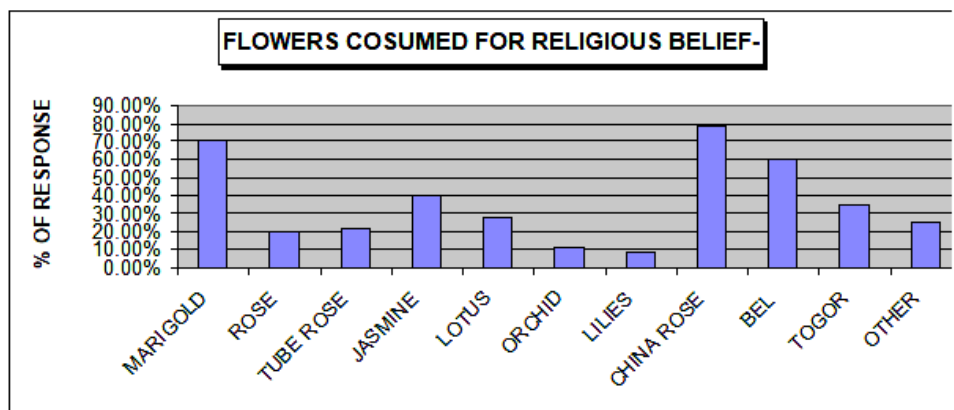
Interpretation: From the data presented above we can say that the most no of consumers purchase the flowers from the small retailers or large retailers, and the % of direct selling from wholesale market is very mere.



(Source: Author's Caculation)

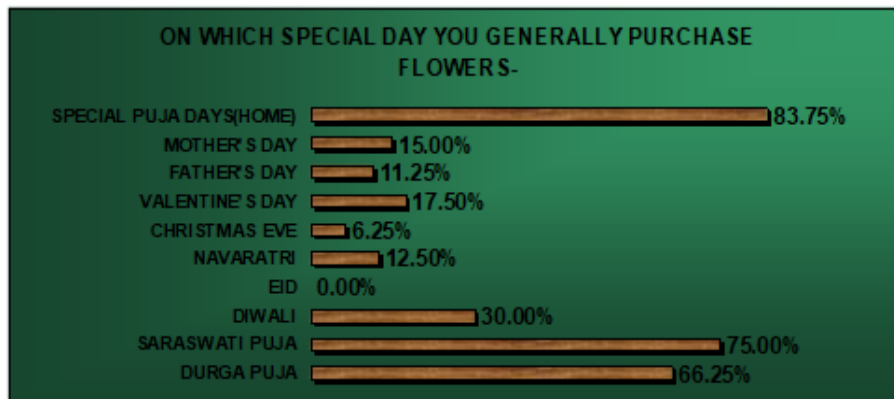
From the data presented above we can again say the religious belief holds the highest response and we can say the Maximum portion of the Floriculture industry is driven by **Religious factor**

15. Type of flowers consumed for various purposes:



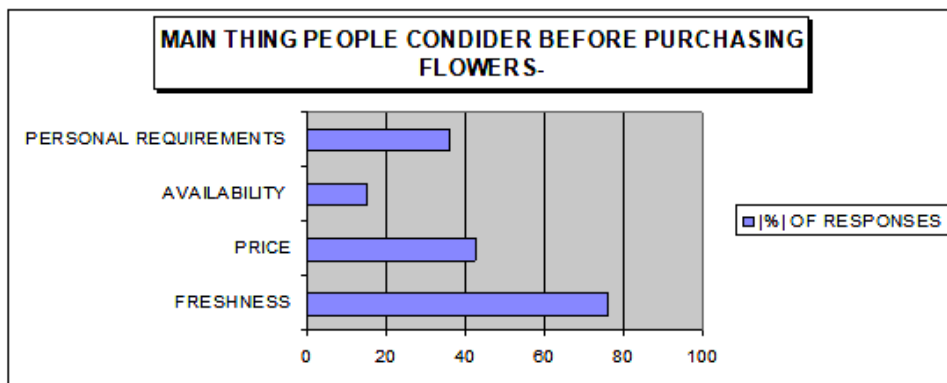
(Source- Author's Caculation)

From the data presented above graphs we can see that the purpose decides the demand for individual type of Flowers, and the purposes are contradictive with each other. **Example-** *China rose* is highly demanded for Religious purpose but it is not demanded for Decoration purpose by the consumers, so we can say purpose of use decides the buying pattern.



(Source- Author's Calculation)

From the data presented above we can clearly say that Most of the people generally purchase flowers for their home or personal places. But we can observe that the people purchase flowers in the special occasions also like *Durga puja & Saraswati puja*. So we can say that the festive period stipulates the demand of the consumers.



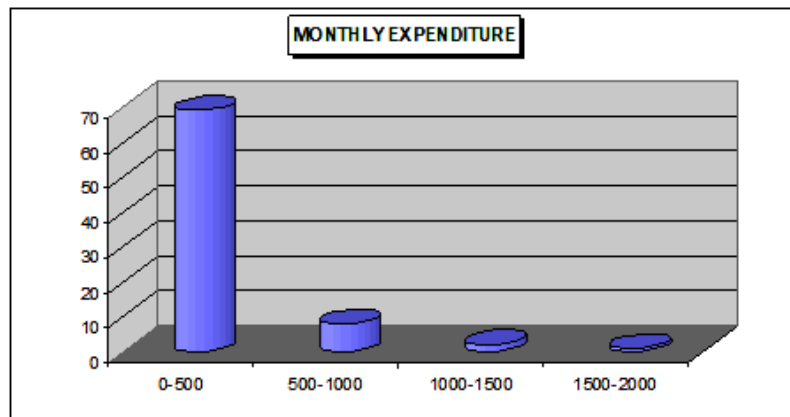
Interpretation: From the data presented above we can say about 30-40% people judge the personal requirements but almost 80% people judge the freshness before purchasing flower from shops.

Table 21: Mean Expenses of the Individual Consumers

Monthly Expenditure(Rs)	Mid Value(X)	Frequency(F)	Deviation D=X-A/I	Fd'
0-500	250	69	-1	-69
500-1000	750	8	0	0
1000-1500	1250	2	1	2
1500-2000	1750	1	2	2
		$\sum F=80$		$+\sum Fd'=-65$

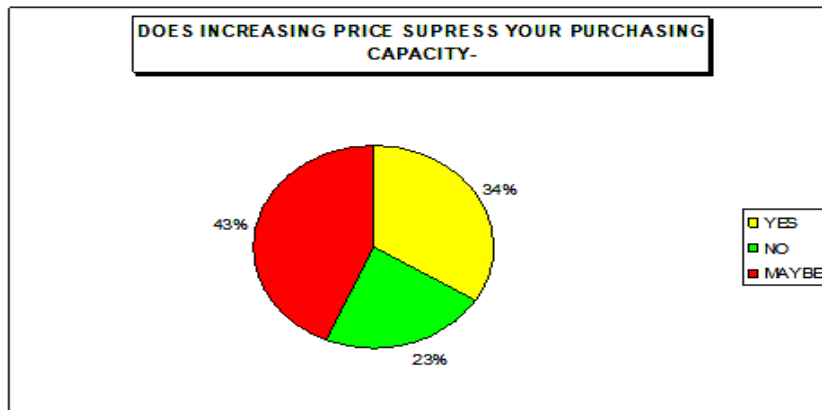
$$A.M.=A+\frac{\sum fd'}{N}=343.75$$

So the average expenses incurred by the individual consumers are near about **344 Rs.**

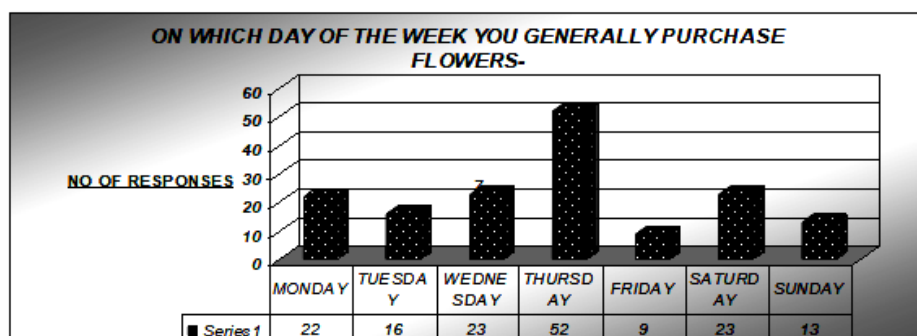


(Source- Author's Caculation)

From the data presented above we can see that most of the family incurred an expense of near about 344 Rs for purchasing the flowers from the market.

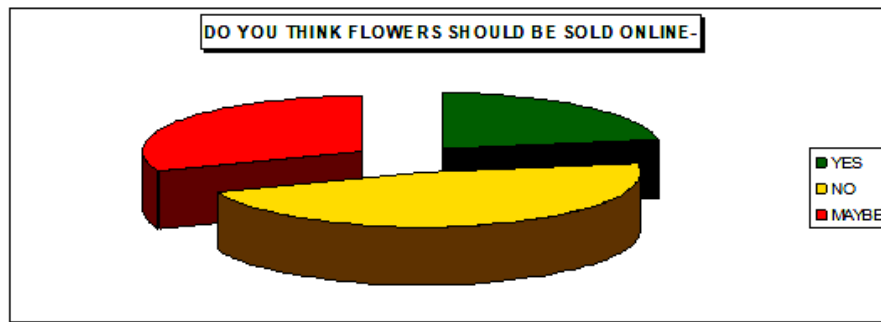


From the data presented above we can clearly say that the increasing price don't suppress the purchasing quantity as the religious belief is the base of the demand schedule.



(Source- Author's Caculation)

From the data presented above we can clearly say that most of the people purchase the flowers in Thursday as the people in Bengal have a culture of laxmi puja in Thursday.



(Source- Author's Caculation)

From the data presented above we can clearly say that the most no of people is against the online marketing of flower.

VII. FINDINGS

From the whole project we have seen the overall perception of the Floriculture industry from different aspects and we also came to know about the inter relation of pricing factors, export condition, consumer behavior and the overall scenario of the floriculture industry as a whole now here are some main findings and recommendation are given below-

1. The productivity of floriculture crops not only depends on the Area but also depends on the various other aspects like irrigation, climatic position etc.
2. More than 50% share of aggregate production of flowers is captured by 5 states.
3. Too much arrival of floriculture crops leads to the reduction in price level.
4. We can say that the various type of flowers have different demand schedule, in the religious festive season the demand of flowers increases every year.
5. MullickGhat flower market is too small w.r.t the buyer seller attendance in the market.
6. Govt. needs to focus more about this place's (MullickGhat flower market) infrastructure & facilities for the sellers of the market.
7. The number of new entrepreneurs is very low in this sector.
8. According to the analysis we can say that the retailers are concerned about the amount of profit not about the % of profit.
9. Marigold and rose loose have a consistent price growth in the time period (2013-14 to 2020-21).
10. The crops attain the highest price in the time of festive season and also in the time of newly arrival in the market.
11. Most of the consumers mainly purchase flowers for religious purpose so we can say the sector is driven by religious factor.
12. According to the analysis the average expenditure incurred by the individual customer for purchasing flower is **Rs-344.00**

VIII. POTENTIAL OF FLORICULTURE IN INDIA

Floriculture has the great potential to develop and flourish in India due to the following opportunities:

1. India's location in tropical and subtropical zone provides for varied agro-climatic conditions. This varies agro-climatic conditions helps in growing any kind of flowers in one or other part of the country, year round.
2. India's geographical location between two major export markets viz, Europe and Asia-Pacific provides an ample amount of opportunities for the floriculture industry.
3. World witnesses scarcity of flowers during winter because of more number of festivals (Christmas, New Year, Valentine Day, International events) during winter and freezing conditions across major production center, Europe. There exists a gap which India can easily fulfill.
4. Availability of semi-skilled manpower at lower rates.
5. Export friendly policies of the government and development of model floriculture center, floriculture Infrastructure Park for the promotion of exports.
6. Flowers are deeply intertwined with Indian culture either festivals or ceremonies from birth to death, flowers occupy a central position. This provides an ample amount of opportunities.

IX. CHALLENGES IN EXPLOITING THIS POTENTIAL

1. Fragmentation of land holdings and the lack of institutional support for the leasing of land is a bottleneck in achieving the scale required to make floriculture profitable.
2. To capture the international market, India needs to attain quality standards. This requires flowers to be grown in greenhouses where temperature, humidity, and other atmospheric parameters can be manipulated to suit the needs. Currently, less than 2 percent of the total area under flower farming in India has poly-housing facilities.
3. Lack of institutional support through suitable market survey and related information.
4. High airfreight cost in India makes Indian goods less competitive when compared with goods from African and Latin American countries.
5. Lack of an integrated infrastructure from the hinterland to export centers makes the business expensive.
6. High initial investments act as a barrier for the marginal and small farmers who are dependent on hand to mouth subsistence.

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- [2] AGRICULTURAL CENSUS-2021
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- [1] <http://nhb.gov.in/OnlineClient/MonthwiseAnnualPriceandArrivalReport.aspx?enc=3ZOO8K5Czc dC/Yq6HcdIxJ4o5jmAcGG5QGUX3BIAP4=>
- [2] <https://apeda.gov.in/apedawebsite/>

ANNEXURE: I**Table 22: State Wise Productivity of Loose Flowers- (Mt/Ha)-**

State wise productivity of loose flowers				
Sl. No	States	2018-19	2019-20	2020-21
1	Andhra Pradesh	8.07	14.16	16.67
2	Arunachal Pradesh	0.47	0.47	1.5
3	Assam	6.67	6.71	6.71
4	Bihar	12.01	12.01	10.17
5	Chhattisgarh	3.78	4.06	3.6
6	Gujarat	9.45	9.49	7.45
7	Haryana	10.48	10.2	10.34
8	Himachal Pradesh	32.55	25.33	19.17
9	Jammu & Kashmir	0.6	0.6	0.6
10	Jharkhand	4.85	12.7	5.62
11	Karnataka	7.28	4.56	7.37
12	Kerala	0	0	0
13	Madhya Pradesh	11.73	8.31	12.41
14	Maharashtra	5.97	5.28	5.3
15	Manipur	0.39	0.68	3.01
16	Meghalaya	0	0	0
17	Mizoram	4.32	2.3	0
18	Nagaland	12.72	0.31	0
19	Odisha	3.78	3.78	3.77
20	Punjab	6.23	6.25	5.15
21	Rajasthan	1.76	1.49	2.02
22	Sikkim	68.18	68.18	68.18
23	Tamil Nadu	13.81	12.87	14.1
24	Telengana	3.77	3.41	4.83
25	Uttar Pradesh	1.99	2.19	0.16
26	Uttara Khand	1.14	1.48	1.66
27	West Bengal	2.72	2.74	2.8
	Other	4.03	0.19	0.16
	Total	5.97	5.55	6.06

(Horticulture Statistics at a Glance-2021)

Table 23: Production Share of Leading Flower Producing States 2020-21

SI No	Name of States/UTS	Production (In'000 Mt)	% Share
1	Tamil Nadu	482.52	17.327042
2	Andhra Pradesh	428.95	15.403371
3	Karnataka	323.86	11.629644
4	Madhya Pradesh	282.79	10.154842
5	West Bengal	279.35	10.031313
6	Chhatisgarh	227.03	8.1525291
7	Gujarat	152.16	5.4639864
8	Uttar Pradesh	111.62	4.0082161
9	Assam	90.01	3.2322122
10	Maharashtra	86.06	3.0903698
	Others	320.44	11.506834
	All India Total	2784.78	100

(Horticulture Statistics at a Glance-2021)

Table 24: State Wise Area and Production of Flowers

States/UTS	2018-19		2019-20		2020-21	
	Area	Production	Area	Production	Area	Production
Andhra Pradesh	18.25	147.28	19.03	263.53	25.74	428.95
Arunachal Pradesh	0.02	0.01	0.02	0.01	0	0
Assam	5.05	33.68	5.03	33.76	5.06	33.93
Bihar	0.66	7.88	0.66	7.96	0.55	5.54
Chhattisgarh	11.43	43.2	11.92	48.38	13.18	47.45
Gujarat	19.5	184.16	20.64	195.98	20.43	152.16
Haryana	6.02	63.03	5.51	56.23	5.49	56.73
Himachal Pradesh	0.72	23.4	0.71	17.95	0.64	12.35
Jammu & Kashmir	49.09	29.41	49.58	29.7	49.58	29.7
Jharkhand	0.32	1.53	1.05	13.33	0.8	4.47
Karnataka	31.68	230.46	52.37	238.73	31.36	230.96
Kerala	12.88	0.02	16.05	0.03	38.25	0.08
Madhya Pradesh	18.42	216	17.67	146.76	19.79	245.55
Maharashtra	12	71.62	6.78	35.78	5.49	29.08
Manipur	0.17	0.07	0.08	0.05	0.16	0.49
Meghalaya	0.06	0	0.01	0	0.01	0
Mizoram	0.13	0.56	0.2	0.46	0.24	0
Nagaland	0.07	0.89	0.05	0.02	0.07	0
Odisha	6.56	24.78	6.57	24.82	6.61	24.91
Punjab	2	12.46	2.05	12.82	2.07	10.67
Rajasthan	3.33	5.85	2.71	4.03	3.49	7.07
Sikkim	0.24	16.5	0.24	16.5	0.24	16.5
Tamil Nadu	30.59	422.44	32.37	416.56	34.23	482.52
Telangana	3.71	13.98	2.95	10.06	3.71	17.92
Uttar Pradesh	17.2	34.31	21	45.97	21.22	46.42
Uttara Khand	1.54	1.75	1.4	2.07	1.53	2.54
West Bengal	25.63	69.62	26.04	71.27	26.78	74.88
Other	0.34	1.36	3.59	0.68	7.33	1.17
Total	277.57	1656.24	306.28	1699.42	324	1962.03

(Horticulture Statistics at a Glance-2021)

Table 25: Wholesale Price and Arrival of Marigold

(Supply in Mt and Price/Qt)

Month	Whole Sale Price				Agg. Arrival			
	2021	2020	2019	2018	2021	2020	2019	2018
January	4037	5219	2394	2816	5090	3058	5274	4154
February	3888	2837	2027	3194	4510	4280	18210	4470
March	6815	2996	2175	4679	3276	4980	5560	2734
April	4679	2620	2190	3188	3394	3868	3428	3084
May	4500	2381	3773	4017	3028	3856	3396	2944
June	4221	3121	3882	3050	3258	4066	2436	2824
July	6596	7888	8060	5116	3240	2524	1176	2082
August	6292	9004	13885	6170	3200	2284	1780	2318
September	4093	4990	4741	4250	4180	3402	3154	2260
October	7093	2907	6875	7885	5100	4890	3410	2308
November	4854	3357	4405	4410	4830	4050	3178	3192
December	4196	2917	7210	2142	4550	4580	2228	4358

SOURCE <http://nhb.gov.in/OnlineClient/MonthwiseAnnualPriceandArrivalReport.aspx?enc=3ZOO8K5CzcdC/Yq6HcdIxJ4o5jmAcGG5QGUXX3B1AP4> = RETRIVED AT-15TH
MARCH 2022 11.04 PM

Table 26: Wholesale price and arrival rose loose

(Supply in MT and Price/Qt)

Rose Loose	Whole Sale Price				Agg. Arrival			
	2021	2020	2019	2018	2021	2020	2019	2018
January	17111	15221	11635	10616	342	300	412	418
February	28042	18870	17698	15208	242	244	484	472
March	14760	13130	8827	6679	320	320	486	404
April	16500	11978	8226	8452	204	272	390	210
May	19241	10731	14644	6140	504	342	384	306
June	22063	8808	6630	4125	200	378	308	346
July	18173	10548	6169	7540	248	296	236	310
August	20000	8550	11183	7590	180	196	198	392
September	20045	17190	12630	12030	190	148	234	394
October	24428	16280	16204	17067	472	350	512	362
November	28000	12418	17690	14417	260	228	726	298
December	28239	14106	19379	14337	224	382	220	352

SOURCE <http://nhb.gov.in/OnlineClient/MonthwiseAnnualPriceandArrivalReport.aspx?enc=3ZOO8K5CzcdC/Yq6HcdIxJ4o5jmAcGG5QGUXX3B1AP4> = RETRIVED AT-15TH
MARCH 2022 11.04 PM

Table 27: Wholesale Price and Arrival Tube Rose

(Supply in MT and Price/Qt)

Tube Rose	Whole Sale Price				Agg. Supply			
	2021	2020	2019	2018	2021	2020	2019	2018
January	6106	16519	9481	12650	2942	1042	1472	584
February	4152	21614	12958	13167	2710	738	1484	790
March	10625	16696	10769	8746	1874	1550	1310	942
April	6188	14978	9500	11429	2202	1436	806	642
May	6060	7365	5548	5813	2124	2268	1420	994
June	4365	6868	6340	5019	2698	2350	1246	1230
July	3833	6471	5033	4920	2688	2406	1690	1342
August	12625	12880	13558	8580	1790	1862	556	1192
September	13663	18381	12348	11260	2094	1562	866	836
October	17190	5650	17083	16979	2508	2512	1022	1308
November	8635	4048	10200	8520	2460	2312	1004	1260
December	4700	4356	13067	6010	2732	2462	1034	1560

Source:

<http://nhb.gov.in/OnlineClient/MonthwiseAnnualPriceandArrivalReport.aspx?enc=3ZOO8K5CzcdC/Yq6HcdIxJ4o5jmAcGG5QGUXX3BIAP4> = RETRIVED AT-15TH MARCH 2022
11.04 PM

Table 28: Regression Analysis of Wholesale Price and Arrival of Marigold

(Supply in Qt and Price/Qt)

SUMMARY OUTPUT							
Regression Statistics							
Multiple R	0.411562						
R Square	0.169383						
Adjusted R Square	0.151326						
Standard Error	2073.681						
Observations	48						
ANOVA							
	df	SS	MS	F	Significance F		
Regression	1	40337745	40337745	9.380541	0.003658177		
Residual	46	1.98E+08	4300151				
Total	47	2.38E+08					
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%
Intercept	6173.92	575.7914	10.72249	4.23E-14	5014.91199	7332.928117	5014.91199
X Variable 1	-0.03942	0.01287	-3.06277	0.003658	-0.06532414	-0.013511918	-0.06532414

(Source: Authors calculation)

Table 29: Regression Analysis of Wholesale Price and Arrival of Rose Loose

(Supply in Qt and Price/Qt)

SUMMARY OUTPUT							
Regression Statistics							
Multiple R	0.1023						
R Square	0.010465						
Adjusted R Square	-0.01105						
Standard Error	5921.521						
Observations	48						

ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	17058747	17058747	0.486497	0.489004			
Residual	46	1.61E+09	35064409					
Total	47	1.63E+09						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	16117.28	2652.868	6.075418	2.23E-07	10777.33	21457.22	10777.33	21457.22
X Variable 1	-0.53569	0.768016	-0.69749	0.489004	-2.08162	1.01025	-2.08162	1.01025

(Source: Authors calculation)

Table 30: Regression Analysis of Wholesale Price and Arrival of Tube Rose

(Supply in Qt and Price/Qt)

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.490919							
R Square	0.241002							
Adjusted R Square	0.224502							
Standard Error	4054.35							
Observations	48							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	2.4E+08	2.4E+08	14.60619	0.000396			
Residual	46	7.56E+08	16437755					
Total	47	9.96E+08						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	15186.3	1513.216	10.03578	3.63E-13	12140.35	18232.25	12140.35	18232.25
X Variable 1	-0.32857	0.085973	-3.8218	0.000396	-0.50163	-0.15552	-0.50163	-0.15552

(Source: Authors calculation)

Table 31: Statement Showing Per Qt. Variable Cost, Sales and Contribution of Marigold**(All the cost are/Qt)**

Year	Months	V. Cost (Wholesale Price)	Sales (Retail Price)	Contribution (Sales-VC)	PV Ratio
2018	January	2816	3832	1016	26.51357
2018	February	3194	4175	981	23.49701
2018	March	4679	5758	1079	18.73915
2018	April	3188	4081	893	21.88189
2018	May	4017	5021	1004	19.99602
2018	June	3050	3996	946	23.67367
2018	July	5116	6380	1264	19.81191
2018	August	6170	7732	1562	20.20176
2018	September	4250	5260	1010	19.20152
2018	October	7885	11229	3344	29.78003
2018	November	4410	5660	1250	22.08481
2018	December	2142	3146	1004	31.91354
2019	January	2394	4754	2360	49.64241
2019	February	2027	2871	844	29.39742
2019	March	2175	3088	913	29.56606
2019	April	2190	3195	1005	31.4554
2019	May	3773	6608	2835	42.90254
2019	June	3882	4932	1050	21.28954
2019	July	8060	9531	1471	15.43385
2019	August	13885	17800	3915	21.99438
2019	September	4741	6370	1629	25.573
2019	October	6875	9123	2248	24.64102
2019	November	4405	5929	1524	25.70417
2019	December	7210	9375	2165	23.09333
2020	January	5219	6731	1512	22.46323
2020	February	2837	4248	1411	33.21563
2020	March	2996	4522	1526	33.74613
2020	April	2620	4130	1510	36.56174
2020	May	2381	3854	1473	38.22003
2020	June	3121	4783	1662	34.74807
2020	July	7888	10269	2381	23.18629
2020	August	9004	11580	2576	22.24525
2020	September	4990	6762	1772	26.20526
2020	October	2907	4529	1622	35.81365
2020	November	3357	4943	1586	32.08578
2020	December	2917	4392	1475	33.58379
2021	January	4037	5630	1593	28.29485
2021	February	3888	5563	1675	30.10965
2021	March	6815	9217	2402	26.06054
2021	April	4679	6717	2038	30.34093
2021	May	4500	6283	1783	28.37816
2021	June	4221	5971	1750	29.30832
2021	July	6596	8788	2192	24.9431
2021	August	6292	8063	1771	21.96453
2021	September	4093	5705	1612	28.25592
2021	October	7093	9696	2603	26.84612
2021	November	4854	6958	2104	30.23857
2021	December	4196	6000	1804	30.06667

(Source: Authors calculation)

Table 32: Statement Showing Per Qt. Variable Cost, Sales and Contribution of Rose Loose.**(All the cost are/Qt)**

Year	Months	V. Cost (Wholesale Price)	Sales (Retail Price)	Contribution (Sales-Vc)	Pv Ratio
2018	January	10616	15020	4404	29.32091
2018	February	15208	20750	5542	26.70843
2018	March	6679	9750	3071	31.49744
2018	April	8452	11319	2867	25.32909
2018	May	6140	9167	3027	33.02062
2018	June	4125	6069	1944	32.03164
2018	July	7540	10108	2568	25.40562
2018	August	7590	10388	2798	26.93492
2018	September	12030	15920	3890	24.43467
2018	October	17067	22229	5162	23.22192
2018	November	14417	18896	4479	23.70343
2018	December	14337	19538	5201	26.61992
2019	January	11635	15962	4327	27.10813
2019	February	17698	24208	6510	26.89194
2019	March	8827	12923	4096	31.69543
2019	April	8226	12357	4131	33.43044
2019	May	14644	20250	5606	27.68395
2019	June	6630	10060	3430	34.09543
2019	July	6169	9096	2927	32.17898
2019	August	11183	15846	4663	29.42698
2019	September	12630	17739	5109	28.80095
2019	October	16204	21852	5648	25.8466
2019	November	17690	23517	5827	24.77782
2019	December	19379	25333	5954	23.50294
2020	January	15221	20385	5164	25.33235
2020	February	18870	25174	6304	25.04171
2020	March	13130	18391	5261	28.60638
2020	April	11978	17174	5196	30.25504
2020	May	10731	15538	4807	30.93706
2020	June	8808	12481	3673	29.42873
2020	July	10548	14346	3798	26.47428
2020	August	8550	11640	3090	26.54639
2020	September	17190	22048	4858	22.03374
2020	October	16280	21220	4940	23.27992
2020	November	12418	16500	4082	24.73939
2020	December	14106	18596	4490	24.14498
2021	January	17111	22741	5630	24.75705
2021	February	28042	34125	6083	17.82564
2021	March	14760	20860	6100	29.24257
2021	April	16500	22583	6083	26.93619
2021	May	19241	26000	6759	25.99615
2021	June	22063	29750	7687	25.83866
2021	July	18173	25346	7173	28.30032
2021	August	20000	26792	6792	25.35085
2021	September	20045	27682	7637	27.58832
2021	October	24428	32040	7612	23.7578
2021	November	28000	35833	7833	21.85974
2021	December	28239	37348	9109	24.38953

(Source: Authors calculation)

Table 33: Statement Showing Per Qt. Variable Cost, Sales & Contribution of Tube Rose.**(All the cost are/Qt)**

Year	Months	Wholesale Price	Retail Price	Contribution (Retailer)	% of Contribution
2018	January	12650	17200	4550	26.45349
2018	February	13167	18958	5791	30.54647
2018	March	8746	12229	3483	28.48148
2018	April	11429	15667	4238	27.05049
2018	May	5813	9146	3333	36.44216
2018	June	5019	7308	2289	31.32184
2018	July	4920	7240	2320	32.0442
2018	August	8580	11940	3360	28.1407
2018	September	11260	15360	4100	26.69271
2018	October	16979	22250	5271	23.68989
2018	November	8520	12360	3840	31.06796
2018	December	6010	9192	3182	34.61706
2019	January	9481	13327	3846	28.85871
2019	February	12958	17500	4542	25.95429
2019	March	10769	15519	4750	30.60764
2019	April	9500	14976	5476	36.56517
2019	May	5548	9135	3587	39.26656
2019	June	6340	9820	3480	35.43788
2019	July	5033	7712	2679	34.73807
2019	August	13558	19173	5615	29.28598
2019	September	12348	17170	4822	28.08387
2019	October	17083	23292	6209	26.65722
2019	November	10200	14440	4240	29.36288
2019	December	13067	19125	6058	31.67582
2020	January	16519	21731	5212	23.98417
2020	February	21614	28859	7245	25.10482
2020	March	16696	23217	6521	28.08718
2020	April	14978	20239	5261	25.99437
2020	May	7365	10808	3443	31.85603
2020	June	6868	10160	3292	32.40157
2020	July	6471	12769	6298	49.32258
2020	August	12880	16840	3960	23.51544
2020	September	18381	23381	5000	21.38489
2020	October	5650	8132	2482	30.5214
2020	November	4048	5848	1800	30.77975
2020	December	4356	5981	1625	27.16937
2021	January	6106	8370	2264	27.04898
2021	February	4152	5633	1481	26.2915
2021	March	10625	15271	4646	30.42368
2021	April	6188	9542	3354	35.14986
2021	May	6060	9020	2960	32.81596
2021	June	4365	6292	1927	30.62619
2021	July	3833	5742	1909	33.24626
2021	August	12625	15792	3167	20.05446
2021	September	13663	18341	4678	25.5057
2021	October	17190	20978	3788	18.05701
2021	November	8635	11667	3032	25.98783
2021	December	4700	6804	2104	30.92299

(Source: Authors calculation)

Table 34: Monthly Average Retail Price/Qt of Marigold (2013-14 To 2020-21)

Months	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
April	1739	2877	4817	3904	2663	4081	3195	4130
May	1300	2485	4585	2804	2204	5021	6608	3854
June	1861	4962	3916	6296	4712	3996	4932	4783
July	8900	6480	5174	9200	10462	6380	9531	10269
August	11660	5804	5454	4067	12625	7732	17800	11580
September	11647	3821	3573	2744	7550	5260	6370	6762
October	6113	1841	8175	3161	3987	11229	9123	4529
November	1385	3021	4096	2692	2100	5660	5929	4943
December	1396	2040	2480	3456	3540	3146	9375	4392
January	2703	3232	2423	3548	3832	4754	6731	5630
February	4838	2222	3265	3103	4175	2871	4248	5563
March	2120	2275	2680	4520	5758	3088	4522	9217
Average of the Years	4639	3422	4220	4125	5301	5268	7364	6304

Source:<http://nhb.gov.in/OnlineClient/MonthwiseAnnualPriceandArrivalReport.aspx?enc=3Z0O8K5CzcdC/Yq6HcdIxJ4o5jmAcGG5QGUXX3BIAP4=> RETRIVED AT-15TH MARCH 2022 11.04 PM

Table 35: Monthly Average Retail Price/Qt of Tube Rose (2013-14 to 2020-21)

Months	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
April	18455	13795	14829	22478	15750	15667	14976	20239
May	10943	9778	8808	9083	8000	9146	9135	10808
June	5373	14058	6676	12240	11409	7308	9820	10160
July	8788	6208	8889	15135	12712	7240	7712	12769
August	19260	16000	19771	30625	20396	11940	19173	16840
September	19028	12667	16692	29923	21000	15360	17170	23381
October	20674	10443	23091	17000	27370	22250	23292	8132
November	17779	13125	25870	12229	17160	12360	14440	5848
December	17558	10900	30640	13704	15420	9192	19125	5981
January	21091	15360	24000	15052	17200	13327	21731	8370
February	28623	15217	29087	17351	18958	17500	28859	5633
March	12423	11354	41400	26000	12229	15519	23217	15271
Average of the Years	16666	12409	20813	18402	16467	13067	17388	11953

SOURCE<http://nhb.gov.in/OnlineClient/MonthwiseAnnualPriceandArrivalReport.aspx?enc=3Z0O8K5CzcdC/Yq6HcdIxJ4o5jmAcGG5QGUXX3BIAP4=> RETRIVED AT-15TH MARCH 2022 11.04 PM

Table 36: Monthly Average Retail Price/Qt of Rose Loose (2013-14 to 2020-21)

Months	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
April	12860	9841	6604	8783	10058	11319	12357	17174
May	9900	7714	8981	10042	9560	9167	20250	15538
June	6870	5809	6184	8620	14061	6069	10060	12481
July	8738	4616	5996	10088	8769	10108	9096	14346
August	13240	9192	9175	10542	13021	10388	15846	11640
September	12500	6596	16596	16000	10548	15920	17739	22048
October	11500	11928	20114	19565	20739	22229	21852	21220
November	17765	16250	27478	16021	14800	18896	23517	16500
December	17077	23400	29760	20463	16250	19538	25333	18596
January	17909	15840	19654	11865	15020	15962	20385	22741
February	31656	19217	23087	26730	20750	24208	25174	34125
March	8477	4825	13900	11108	9750	12923	18391	20860
Average of the Years	14041	11269	15627	14152	13611	14727	18333	18939

SOURCE <http://nhb.gov.in/OnlineClient/MonthwiseAnnualPriceandArrivalReport.aspx?enc=3ZOO8K5CzcdC/Yq6HcdIxJ4o5jmAcGG5QGUXX3B1AP4=> RETRIVED AT-15TH MARCH 2022 11.04 PM

QUESTIONNAIRE FOR CONSUMERS

1. What is your name?	Mark only one oval.
2. Do you purchase flowers from market?	Yes No
3. How frequently you purchase flowers?	Mark only one oval. Once in a week More than once in a week Once in a month Rarely More than once in a month
4. What is the main thing you consider before purchasing the flower ?	Check all that apply. Fragrance Beauty Needed for religious belief. Other:
5. What is the monthly expenditure of your family for purchasing flowers?	Mark only one oval. 0-500 501-1000 1001-2000 More than 2000
6. For which places you generally purchase flowers -	Check all that apply. For Home For Temple/Masjid/church Other
7. For what purpose do you generally purchase flowers?	Check all that apply. For aesthetical belief

	For Decoration purpose For Ceremonial purpose For gift purpose. For Religious purposes (Puja purposes) Other:
8. What type of flowers you generally purchase for religious purpose?	<u>Check all that apply.</u> Marigold Rose Tube rose Jasmine Lotus Orchid Lilies China Rose Bel
9. What type of flowers you Generally purchase for aesthetical purpose-	<u>Check all that apply.</u> Jasmine Rose Marigold Other Tube rose Orchid Lilies Seasonal Lotus
10. What type of flowers you Generally purchase for Gifting and Decoration purpose-	<u>Check all that apply.</u> Lilies Orchids Roses Seasonal flowers Others
11. On which festival/ special day you generally purchase flowers	<u>Check all that apply.</u> Durga Puja Saraswati puja Diwali Eid Navaratri Christmas Eve Valentine's Day Father's Day Mothers Day Special Puja purposes
12. On which day you generally purchase flowers (in a week)	<u>Check all that apply.</u> Monday Tuesday Wednesday Thursday

	Friday Saturday Sunday
13. What is the main thing you consider before purchasing flowers	<u>Check all that apply.</u> Freshness Price Availability Your requirements
14. Does increasing price suppress your purchasing quantity-	<u>Mark only one oval.</u> No Yes Maybe
15. Do you purchase leafs(like tulsi leaf, Bel leaf, Mango leaf) along with flowers-	Yes No
16. From which place you generally purchase flowers-	<u>Check all that apply.</u> Local market Small Retailers Wholesale market Other sources
17. In which manner you generally purchase flowers-	<u>Check all that apply.</u> Ready Garland Cut flowers Bouquet Bunch
18. Do You think more flowers should be sold through online marketing-	<u>Mark only one oval.</u> Yes No Maybe
19. What is your favourite flower-	<u>Check all that apply.</u> Rose Orchid Tube rose Jasmine Marigold Other:
20. What is your suggestions for increasing the efficiency of floral market (few words)	