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Analysis of seasonality of market arrivals and prices of major oilseeds in selected Krishi Upaj Mandies in Chhattisgarh

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Abstract

The present study conducted with three major oilseeds *i.e.* soybean, groundnut and mustard of Chhattisgarh. The secondary data of monthly arrivals and prices from period of 2006-7 to 2020-21 were collected for calculation of seasonality. Study were started with selection of four Krishi Upaj Mandies (KUM's) *i.e.* KUM Rajnandgaon, KUM Bemetara, KUM Pathalgaon and KUM Ramanujanj according to maximum arrivals of selected oilseeds. The study found that soybean is maximum arrivals in selected mandies instead of other oilseeds. The peak season of arrivals of soybean were observed in the month of November, October, December and January, respectively in Rajnandgaon and Bemetara Mandies. The peak season of groundnut was found November, December and October months in Bemetara and Pathalgaon mandies respectively. Whereas In Ramanujanj mandi peak arrivals of groundnut is noticed in month of January, February and March. Mustard is maximum arrivals in months of April and May in Rajnandgaon and Bemetara mandies. Whereas lowest arrivals were observed in month of November, December in Rajnandgaon Mandi. The highest prices of soybean, groundnut and mustard were found in months May, November and April in Bemetara mandi, respectively. The lean prices for soybean and groundnut were recorded in moths of November and September in Bemetara mandi and for mustard was recorded in November in KUM Pathalgaon.

Keywords: Krishi Upaj Mandi, seasonality, major oilseeds, arrivals and prices, Chhattisgarh

1. Introduction

India is one of the major oilseeds growers and importer of edible oils. According to an estimation of the SEA (Solvent Extractor's Association of India) the total production of oilseed crops, grown during the Kharif and rabi seasons in the 2019-20 (November-October) season, at 251.49 lakh tonnes, nearly 3% higher compared with 244.08 lakh tonnes last year due to higher yield in groundnut and castor seed.

Chhattisgarh is the 9th largest state in terms of area in India. More than 75 per cent of the population engaged in agriculture and 43 percentage arable land under cultivation. In the context of oilseeds, Chhattisgarh shares 233.16 Thousand hectares of area and 122.6 Thousand tonnes of production in 2018-19 (Commissioner of Land Record and Settlement, Chhattisgarh). The production of three major oilseeds *i.e.*, soybean, groundnut and rapeseed-mustard contribute more than eighty percentages in the state. The marketing of oilseeds produces mainly depends on Krishi Upaj Mandies Samiti in the state. At present the state having 69 Krishi Upaj Mandies and 118 sub-mandies (*Upmandis*) to providing marketing facilities and maintained stock of oilseeds produce. Each of these Mandies or market constitutes under Agricultural Produce Market Committee (APMC) all over India. According to Vani and Srikala (2015) [7] revealed that all the market showed an increasing trend in the arrivals of groundnut over the years. The arrivals of groundnut were found to be highest in November and December as revealed by the indices in Adoni market, while the same were highest in August in the markets of Badepalli and Gadwal. Lowest arrivals were conspicuous in July and August in Adoni market and January, May and April in Badepalli market. In Adoni market, highest seasonal index was found in November for groundnut. Lowest index was recorded in January. In Badepalli market highest index was in January, while the minimum index was in February. In Kurnool market, April witnessed peak seasonal price index of 107.8 per cent. The price index was lowest in September. Dudhat *et al.* (2017) [1] the studied was carried out by using time series data of price from 1996 to 2016, to compare the price variation, to measure the price instability and seasonality of important groundnut markets of India *i.e.* Rajkot (Gujarat), Kurnool (Andhra Pradesh) and Villupuram (Tamil Nadu).

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Seasonal indices were observed maximum in August, April and June for Kurnool and Rajkot market respectively. The policy makers and farmers can use this price signal for their future plan. More and Katkade (2016) [4] observed that the arrivals and prices of main oilseeds i.e. safflower and soybean in all selected markets of Marathwada region in Maharashtra were seasonal. Peak season arrivals of soybean and safflower were observed during October to December and March to May, respectively. The price indices of soybean and safflower were highest in December and June, respectively. Soybean was observed maximum arrivals and price of in Latur market. Whereas maximum arrivals of safflower was observed in Latur market but highest price prevailed in Aurangabad market. Kachroo and Nazir (2021) [3] revealed that in all the selected commodities high seasonal indices were observed from March to June indicating high post-harvest arrivals during these months. In the case of soybean and turmeric, the seasonal index for prices is high in April to September, which reveals that there is a lack of storage facilities and the production during these months is very low. This study suggested improvement in the infrastructure, storage, and postharvest techniques so that the arrivals of these commodities get increased and availability should be throughout the year so that the price fluctuation can be minimized. Jadhav *et al.* (2011) [2] Analyze the secondary data of arrival and prices of soybean in Amravati, Morshi, Achalpur and Daryapur market for the period from 1999-00 up to 2008-09. Amongst all selected markets, arrival and price indices was observed to increase in case of soybean compared to the base year. In all selected markets, monthly seasonal index of soybean was found to be the highest immediately after harvest. Whereas price indices of soybean were found to be lowest during peak arrival months and vice-versa.

2. Material and Methods

The study were started with selection of four Krishi Upaj Mandies according maximum arrivals of collectively three major oilseeds soybean, groundnut and mustard in year 2018-19 and 2019-20. The study was based on 15 years of time-series data from 2006-07 to 2020-21. The secondary data about arrivals and prices of major oilseeds were collected from Krishi Upaj Mandies and relevant to the published sources includes website of Chhattisgarh State Marketing (Mandi) Board, <http://agriportal.cg.nic.in/agrimandi>.

2.1 Analytical tools

2.1.1 Seasonal variation (S_t): Seasonal variation at those periodic movements which operate a periodic and regular manner during a period of 12 month or in a year. The main causes of seasonal variation are cultural, environmental and climate etc.

2.1.2 Calculation of seasonal indices of monthly data

To analyze the seasonal variation in prices and arrivals, seasonal indices have been calculated employing twelve months ratio to moving average method. The seasonal indices was calculated by the following steps

1. Generate a series of twelve months moving totals,
2. Generate a series of twelve months moving averages (M.A.): A series of twelve months moving averages is generated by dividing twelve months moving totals by twelve.
3. Generate a series of centered twelve months moving averages: This step involves taking averages of pairs of

two subsequent twelve months moving averages and entering between each pair. There are no corresponding moving averages for the first six and last six months.

4. Express each original value as a percentage of the corresponding centered moving average:
The percentage of moving average represents indices of seasonal and irregular components combined.
5. Than arrange the percentages of moving averages in the form of monthly arrays.
6. Next, the average index for each month has been calculated as A.S.I. or Seasonal indices.

Calculation of twelve month moving Average:

$$M1 = \frac{Y1 + Y2 + Y3 \dots \dots Y12}{12}$$

$$M2 = \frac{Y2 + Y3 + Y4 \dots \dots Y13}{12}$$

$$M3 = \frac{Y3 + Y4 + Y5 \dots \dots Y14}{12}$$

Where,

Mt = 12 month centered M.A. (t = 1, 2,....180)

Yt = Observation (t=1, 2,....180)

3. Result and Discussion

3.1 Seasonality of arrivals and prices of major oilseeds

3.1.1 Seasonal indices of arrivals and prices of soybean in the selected KUM in Chhattisgarh

The seasonal indices of arrivals and prices of soybean are presented in table 1. Its shows the peak arrivals were observed in January, October, November and December in all selected mandies. The highest arrivals was noticed in Rajnandgaon mandi in the month of November (326.44 per cent, followed by October (255.05 per cent, December (187.78 per cent and January (112.74 Per cent, respectively.

Table 1: Seasonal indices of arrivals and prices of soybean in the selected KUM in Chhattisgarh

Month	KUM Rajnandgaon		KUM Bemetara	
	Arrivals	Prices	Arrivals	Prices
January	112.74	101.71	108.92	101.07
February	89.31	101.13	63.60	104.04
March	49.36	101.86	61.39	99.63
April	29.38	103.83	44.38	105.67
May	35.83	107.94	38.78	111.02
June	29.81	105.90	36.67	101.88
July	44.11	101.55	33.81	100.84
August	26.06	100.93	17.53	96.41
September	14.14	97.17	9.13	95.64
October	255.05	90.52	239.90	90.74
November	326.44	93.37	366.77	96.07
December	187.78	94.09	179.11	96.99

The peak arrivals in Bemetara mandi were observed in the month of November (366.77 per cent, October (239.90 per cent, December (179.11 per cent and January (108.92 Per cent, respectively. The highest arrivals of soybean was observed in the month of November (366.77 per cent in Bemetara mandi. The lowest arrivals of soybean were noticed

in the month of September of all selected mandies. The peak prices were observed in month of May (107.94 per cent, June (105.90 per cent and April (103.83 per cent in Rajnandgaon mandi. Whereas higher prices were observed in month of May (111.02 per cent, April (105.67 per cent and February (104.04 per cent, respectively in Bemetara mandi. The highest price was noticed in month of May (111.02 per cent in Bemetara mandi. Whereas lowest prices was estimated in month of October in all selected mandi.

3.2 Seasonal indices of arrivals and prices of groundnut in the selected KUM in Chhattisgarh

The seasonal indices of monthly arrivals and prices of groundnut are presented in the table 2. In Bemetara mandi peak arrivals were observed in three months i.e. November (668.56 per cent, October (258.71 per cent and December (177.40 per cent, respectively.

In KUM Pathalgaon peak arrivals were observed in the months of November (416.87 per cent, followed by October (319.67 per cent, and December (249.86 per cent, respectively.

Table 2: Seasonal indices of arrivals and prices of groundnut in the selected KUM in Chhattisgarh

Month	KUM Bemetara		KUM Pathalgaon		KUM Ramanujganj	
	Arrivals	Prices	Arrivals	Prices	Arrivals	Prices
January	0.00	0.00	86.83	140.26	370.67	133.83
February	0.00	0.00	31.52	118.33	181.55	133.93
March	22.54	44.28	37.64	107.90	166.61	130.87
April	0.00	0.00	6.16	48.33	58.63	124.24
May	61.34	91.15	0.00	0.00	27.51	117.43
June	0.00	0.00	18.27	131.63	0.00	0.00
July	0.00	0.00	16.35	128.80	26.56	56.55
August	0.00	0.00	0.00	0.00	29.24	123.35
September	11.43	42.54	16.83	119.56	158.22	122.47
October	258.71	224.85	319.67	124.11	0.00	0.00
November	668.56	626.59	416.87	143.29	101.71	124.71
December	177.40	170.59	249.86	137.80	79.30	132.63

The peak arrivals in Ramanujganj mandi were noticed in month of January (370.67 per cent, followed by February (181.55 per cent and March (166.61 per cent, respectively.

The month of November (668.56 per cent in Bemetara mandi was shows highest arrivals of all selected mandies in study area.

The seasonal indices of prices in Bemetara mandi were estimated three peak months i.e. November (626.59 per cent, October (224.85 per cent and December (170.59 per cent, respectively. The Bemetara mandi was also shows the highest and lowest prices of groundnut in the months of October (224.85 per cent and September (42.54 per cent compare with other mandies.

In KUM Pathalgaon higher prices were recorded in month of

November (143.29 per cent, followed by January (140.26 per cent and December (137.80 per cent, respectively.

The peak prices in Ramanujganj mandi were observed in February (133.93 per cent, January (133.83 per cent and December (132.63 per cent, respectively.

3.3 Seasonal indices of arrivals and prices of mustard in the selected KUM in Chhattisgarh

The seasonal indices of monthly arrivals and prices of mustard are presented in the table III. The monthly seasonal indices in KUM Rajnandgaon were registered three peak season i.e. April (455.75 per cent, May (199.03 per cent and March (133.71 per cent, respectively. Whereas lowest arrivals was observed in month of December (13.00 per cent.

Table 3: Seasonal indices of arrivals and prices of mustard in the selected KUM in Chhattisgarh

Month	KUM Rajnandgaon		KUM Bemetara		KUM Pathalgaon		KUM Ramanujganj	
	Arrivals	Prices	Arrivals	Prices	Arrivals	Prices	Arrivals	Prices
January	16.96	104.68	0.00	0.00	31.26	68.77	78.77	37.50
February	39.70	101.74	0.00	0.00	68.78	89.54	150.28	166.13
March	144.71	99.14	37.47	47.72	186.56	161.03	232.15	160.59
April	455.75	98.49	194.71	252.45	140.78	118.14	142.14	90.32
May	199.03	98.96	167.32	181.28	117.42	82.68	108.86	71.80
June	117.70	97.80	168.45	117.17	93.68	72.53	62.01	131.11
July	74.77	98.01	0.00	0.00	133.06	132.82	54.29	93.34
August	52.64	100.54	134.31	46.51	146.98	130.05	53.20	67.14
September	27.76	99.50	125.61	186.06	119.95	135.41	45.83	76.41
October	42.53	97.91	129.65	89.71	81.41	106.51	110.38	58.28
November	15.44	99.65	112.78	139.54	18.67	36.57	102.90	138.00
December	13.00	103.58	129.70	139.54	61.44	65.96	59.20	109.40

In KUM Bemetara seasonal indices of arrivals were recorded highest in month of April (194.71 per cent, followed by June (168.45 per cent and May (167.32 per cent, respectively. Whereas lowest arrivals was observed in month of March (37.47 per cent.

The seasonal indices of arrivals in Pathalgaon mandi were observed three peak season in the month of March (186.56

per cent, August (146.98 per cent and April (140.78 per cent, respectively. The lowest arrivals were recorded in the month of November (18.67 per cent.

In Ramanujganj mandi peak arrivals were recorded in month of March (232.15 per cent, February (150.28 per cent and April (142.14 per cent, respectively. Whereas lowest arrivals was recorded in month of September (45.83 per cent.

The seasonal indices of prices of Rajnandgaon mandi were observed highest in month of January (104.68 per cent and December (103.58 per cent. The lowest price was recorded in month of June.

In Bemetara mandi highest prices were observed in month of April (252.45 per cent, followed by September (186.06 per cent and May (181.28 per cent, respectively. Whereas lowest price was noticed in the month of August.

The seasonal indices of prices in Pathalgaon mandi were observed in highest in month of March (161.03 per cent, followed by September (135.41 per cent and July (132.82 per cent, respectively. The lowest prices of the season were noticed in the month of November.

In Ramanujganj mandi highest prices were recorded in month February (166.13 per cent, followed by March (160.59 per cent and November (138 per cent, respectively. Whereas lowest prices was recorded in the month of January.

4. Conclusion

The studied found to be soybean is maximum arrivals instead of other oilseed. But it only arrivals in Rajnandgaon and Bemetara mandies. The four peak season for soybean i.e. November, October, December and January, respectively were observed in both mandies. The peak and lean prices were recorded April, May and October in both mandies.

The study further found Groundnut and mustard are another major oilseed after soybean. The peak arrivals and prices of groundnut in Bemetara and Pathalgaon were noticed November, October and December, respectively. Whereas month of January, February and March found in Ramanujganj mandi. The study clearly shows the lowest arrivals and prices was observed in month of September in Bemetara mandi.

Mustard is arrivals at all selected Krishi Upaj Mandies in Chhattisgarh. The maximum arrivals of was observed in KUM Rajnandgaon in the month of April (455.75 per cent). The lowest arrivals were also found in KUM Rajnandgaon in the month of December (13 per cent). The Highest prices recorded in month April (252.45 per cent) in Bemetara mandi. Whereas lowest prices registered in month of November (36.57 per cent) in KUM Pathalgaon.

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