

RESEARCH PAPER

MSP Effect on Price and Arrivals of Major Crops of Madhya Pradesh

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ABSTRACT

To study the effect of MSP on price and arrivals, Madhya Pradesh was purposively chosen with its major crops, paddy, wheat, soybean, bengal gram, and black gram. With the help of data collected from Agmarknet portal for period 2010-2020 study was carried out. The data was analysed by calculating Weighted averages, Percentages along with Linear trend analysis, Tabular analysis, Correlation analysis, and Seemingly Unrelated Regression. The study found that MSP for selected crops had growth rates ranging from 4.5 to 8.2 percent per annum. Share of arrivals sold below MSP ranged from 15 to 68 percent. MSP had positive relationship with price of commodities but had negative relationship with share of arrivals sold below MSP and price difference from MSP. Thus, MSP had negative effect on arrivals and price reported below MSP. So, procurement should be done by the government for the commodities where 50% of the arrivals are sold below MSP. Government should also provide the facilities (grading, processing, storage etc.) that will be helpful for the farmers to sell their commodities at MSP in the market.

HIGHLIGHTS

- All selected crops have recorded increase in arrivals over time. But post (COVID-19), arrivals in the APMCs have decreased substantially which indicates that farmers sold the crop produce in their villages or to itinerant merchant.
- Arrivals were negatively related with percentage of arrivals sold below MSP, MSP, price reported below MSP and percentage difference between price reported below MSP and MSP.

Keywords: Minimum Support Price, Market Price, Trend, Growth, Arrivals

The minimum prices determined by the government of India for 26 agricultural crops are known as minimum support prices, or MSPs. Designated government agencies enter the market and buy the products at the MSP in order to intervene when the current price falls below the guaranteed MSP. Agricultural price policy has paramount importance in India given that 47 percent of the Indian population was engaged in agriculture. Minimum support price announced by Cabinet Committee on Economic Affairs remained the prime tool used by policy makers in relation to agriculture. This tool was envisaged to have the effect of incentivising

farmers to increase acreage under specific crops while allowing government to use this price for procurement purposes to build food security reserves. It was also reported that a large proportion of country's farmers were not been able to realize the minimum support price for their produce in the regulated markets. Procurement was also restricted to selected crops while MSP was announced for

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26 crops. A counter argument, however, suggests that even in the absence of direct government purchase, the announcement of the MSP can still have a favorable impact on prices. Farmers are more inclined to bargain for better prices from traders if they are aware of the MSP for their crops and believe it to be a “fair outcome” or the “status quo.” Farm harvest price (FHP) is the other price which is closely watched along with MSP. Deshpande and Naik (2002), Singh *et al.* (2002), and Deshpande and Naik (2004) reported departure between movement of MSP and FHP of several crops. In contrast, Latika *et al.* (2012) found a statistically significant positive effect of increase in MSP on FHP for wheat and gram commodities. MSP was found to be higher than and had positive effect on market price of wheat, paddy and mustard in Punjab by Singh *et al.* (2006). Suryawanshi *et al.* (2011), Verma *et al.* (2018), Navasare *et al.* (2018) and Devi *et al.* (2019) reported statistically significant negative relationship between relationship between arrivals and prices. However, Singh *et al.* (2016) found presence of both positive and negative relationship between arrivals and prices across different grades of APMCs. The existing literature on support price for farm commodity in Indian context did not explore the extent and pattern of arrivals sold below support price for a geographically large state. Further, it is yet not known if the MSP has any effect on extent of arrivals sold below MSP. These untouched questions have greater relevance to contemporary policy making in agricultural marketing. With this background, this study was conducted with objectives: to analyse the pattern of arrivals and behaviour of price for arrivals sold below MSP along with factors affecting price difference from MSP and share of arrivals.

METHODOLOGY

This study was carried out by purposively choosing Madhya Pradesh which is one of the leading producers of paddy, wheat, maize, soybean, pulses, and several other crops. The state’s share in procurement has also been rising steadily. For the present study, major crops under different crop groups were considered for detailed investigation in the state of Madhya Pradesh. The selected crops are under the major categories including paddy and wheat in cereals; bengal gram, black gram in pulses;

and soybean in oilseeds. The study is entirely based on secondary data acquired from the Agmarknet portal of Directorate of Marketing and Inspection (DMI) (agmarknet.gov.in). The data was collected for period January 2010 to December 2020 on total arrivals in Madhya Pradesh’s APMC, average price of arrivals, arrivals sold at price below MSP, the price reported below MSP, and minimum support price. For paddy 18,026, for wheat 1,08,235, for Bengal gram 70,275, for black gram 67,997 and for soybean 68,404 observations were collected from the Agmarknet portal. The daily data of price was compiled into monthly and yearly data with the help of weighted averages where arrivals served as weights.

Analytical techniques

1. Percentage analysis

In this study, percentage analysis was performed to determine the percentage of arrivals sold below MSP as a percentage of total arrivals.

Percentage of arrivals sold below MSP =

$$\frac{\text{Arrivals sold below MSP}}{\text{Total Arrivals}} \times 100$$

2. Averaging method

The weighted averaging approach was utilised to get the weighted average price in this study. High-weight data components contribute more to the weighted average in this technique than low-weight data pieces. A weighted average is one in which a weight is provided to each quantity that needs to be averaged. The average relative relevance of each quantity is determined by these weightings. weightings are the equivalent of having that many identical items in the average with the same value. The weighted average of a non-empty finite multiset of data (x_1, x_2, \dots, x_n) with non-negative weights (w_1, w_2, \dots, w_n)

$$W = \frac{\sum_{i=1}^n w_i x_i}{\sum_{i=1}^n w_i}$$

Which expands to: $W = \frac{w_1 x_1 + w_2 x_2 + \dots + w_n x_n}{w_1 + w_2 + \dots + w_n}$

Where,

W = weighted average price,

n = number of terms to be averaged,

w_i = weights applied to x values (arrivals),

x_i = Data values to be averaged (price).

3. Trend analysis

Trend analysis is a method used to fit a general trend to time series data and generate forecasts. In this study, Linear trend analysis was used to find out growth rates by dividing the trend value by average of the series and multiplying by 100.

$$Y_t = \beta_0 + \beta_1 X + \mu_t$$

Where,

Y_t = Arrivals sold below MSP at time $T = t$,

β_0 = Arrivals sold below MSP at time $T = 0$,

β_1 = Rate of change in arrivals sold below MSP over time,

X = Time period,

μ_t = Random error at time $T = t$.

Seemingly Unrelated regression analysis

Seemingly Unrelated regression was used to estimate the system of equations. Percentage of arrivals sold below MSP and percentage difference between MSP and price reported below MSP were chosen as dependent variable for regression analysis. Average price, total arrivals, year and MSP were the important variables selected as regressors. Season (month) and variety were used as dummy variables. The effect of season and variety on prices, as well as the percent point difference between price reported below MSP, were determined by seemingly unrelated regression analysis.

(a) Regression equation for price reported below MSP

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta D + CZ + \mu$$

Where,

Y = Price reported below MSP,

β_0 = coefficient for the intercept (constant),

β_1 = coefficient for the year,

X_1 = time,

β_2 = coefficient for the MSP,

X_2 = MSP,

β_3 = coefficient for the arrivals,

X_3 = arrivals

β = vector of coefficient of dummy variable regressors (month/season and variety),

D = vector of dummy variable regressors (month/season and variety),

C = vector of coefficient of any other dummy variable regressors,

Z = vector of any other dummy variable regressors,

μ = residual

(b) Regression equation for arrivals

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta D + CZ + \mu$$

Where,

Y = Arrivals,

β_0 = coefficient for the intercept (constant),

β_1 = coefficient for the year,

X_1 = time,

β_2 = coefficient for the MSP,

X_2 = MSP,

β = vector of coefficient of dummy variable regressors (month/season and variety),

D = vector of dummy variable regressors (month/season and variety),

C = vector of coefficient of any other dummy variable regressors,

Z = vector of any other dummy variable regressors,

μ = residual

(c) Regression equation for percentage price difference from MSP

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta D + CZ + \mu$$

Where,

Y = percentage price difference from MSP,

β_0 = coefficient for the intercept (constant),

β_1 = coefficient for the year,

X_1 = time,

β_2 = coefficient for the arrivals,

X_2 = arrivals,

β = vector of coefficient of dummy variable regressors (month/season and variety),

D = vector of dummy variable regressors (month/season and variety),

C = vector of coefficient of any other dummy variable regressors,

Z = vector of any other dummy variable regressors,

μ = residual

Correlation analysis was used to decipher the linear association between variables

Data preparation and tabular analysis was performed with the help of MS Excel© and R software & R studio©. The Gretl (2012b)© software was used to carry out Seemingly Unrelated Regression.

RESULTS AND DISCUSSION

Table 1 provides minimum support price year-wise for selected crops under study. From Table 1, it can be observed that the minimum support price of paddy and wheat had risen at slow pace of 5.91 and 4.59 percent, respectively over the period 2010 to 2020. This was on account of rice and wheat being staples across the country and consistently higher growth in MSP of these two staple crops would lead to inflation and food affordability issues. In contrast, MSP of Bengal gram, black gram, and soybean had high growth of 7.07, 6.19, and 8.24 percent; policymakers wanted to incentivize cultivators of these crops to produce more crop by giving higher support and procurement prices to reduce import dependence. By the end of 2020 decade, the Government of India increased MSP of Black gram and soybean by a large amount.

Table 1: Year wise Minimum Support Price of Major Crops of Madhya Pradesh (2010-2020)
Unit: ₹/Quintal

Year	Paddy	Wheat	Soybean	Bengal gram	Black gram
(1)	(2)	(3)	(4)	(5)	(6)
2010	1000	1170	1440	2100	2900
2011	1080	1285	1690	2800	3300
2012	1250	1350	2240	3000	4300

2013	1310	1400	2560	3100	4300
2014	1360	1450	2560	3175	4350
2015	1410	1525	2600	3500	4625
2016	1470	1625	2775	4000	5000
2017	1550	1625	2775	4000	5400
2018	1750	1735	3399	4400	5600
2019	1815	1840	3710	4620	5700
2020	1868	1925	3880	4875	6000
Growth Rate (%)	5.91	4.59	8.24	7.07	6.19

Table 2 provides total arrivals and percentage of it sold below MSP in APMCs of Madhya Pradesh. From Table 2, it can be observed that over 2010-2020 period, wheat had the highest arrivals but one fifth of its arrivals sold below MSP which can be attributed to procurement of wheat in the state. Soybean had the second highest arrivals and similar to wheat with over one sixth of its total arrivals sold below MSP. The lowest share of arrivals sold below MSP was for paddy (15.27 percent). In contrast, bengal gram and black gram recorded over 50 percent of total arrivals sold below MSP. All five crops have recorded increase in arrivals over time. But after onset of Corona virus (COVID-19) pandemic, arrivals in the APMCs have decreased substantially which indicates that farmers sold the crop produce in their villages or to itinerant merchant. With decrease in arrivals and supply side constraints during pandemic, share of arrivals sold below MSP decreased except for wheat compared to 2019. Arrivals in various regulated markets were positively correlated with pricing. Singh *et al.* (2016).

Table 2: Year wise total arrivals and its percentage share sold below MSP in APMCs for Major Crops of Madhya Pradesh (2010-2020)
Unit: 000' Tonnes

Year	Paddy	Wheat	Soybean	Bengal gram	Black gram
(1)	(2)	(3)	(4)	(5)	(6)
2010	638 (18.69)	4924 (4.58)	6886 (0.02)	275 (50.61)	174 (68.51)
2011	963 (22.88)	6266 (53.44)	6846 (0.04)	217 (73.70)	207 (85.18)
2012	812 (53.62)	8287 (35.68)	5711 (0.29)	248 (1.52)	300 (92.97)
2013	931 (10.48)	8604 (1.21)	5317 (0.41)	672 (37.39)	243 (69.04)

2014	1564 (4.08)	10702 (3.85)	4742 (0.15)	629 (92.56)	360 (59.67)
2015	1907 (6.55)	8590 (23.28)	3186 (0.22)	248 (26.66)	274 (4.95)
2016	1986 (8.58)	7179 (37.79)	2833 (4.64)	904 (0.74)	280 (3.45)
2017	1974 (23.76)	7467 (20.06)	3909 (79.20)	1071 (2.68)	859 (89.92)
2018	1848 (19.44)	7434 (20.43)	4472 (63.56)	2142 (79.79)	292 (85.33)
2019	2017 (14.08)	10196 (11.60)	4026 (46.29)	1557 (93.14)	295 (87.24)
2020	1793 (9.27)	8674 (33.00)	2254 (36.49)	700 (61.52)	94 (57.43)
Total	16433 (15.27)	88323 (21.31)	50184 (17.56)	8663 (55.73)	3379 (68.48)

Note: Figures within parenthesis indicates percentage of total arrivals sold below MSP

After 2016, all crops have recorded a sudden and substantial jump in share of arrivals sold below MSP, except for wheat. This change can be attributed to demonetization of ₹ 500 and ₹ 1000 currency notes by the Government of India on 08-11-2016. This demonetization event led to a liquidity crunch in the economy and in particular agriculture commodity traders. The trend in arrivals and price of jowar, wheat, soybean, pigeon pea, and chick pea fluctuated year to year (2000-01 to 2011-12), Hile *et al.* (2017). According to Keynes, liquidity in

the market is key driver of commodity and security prices. Higher liquidity in markets allows for higher prices. Sudden decrease in liquidity resulted in lower prices of crop produce. This explanation is also consistent with rationality which demands that traders should gain maximum share of trade with given amount of funds. Thus, with limits on funds, traders would try to quote lower prices to purchase as much larger amount of produce as possible. Apart from demonetisation demonetization effect, Madhya Pradesh Government had launched one scheme called “*Mukhya Mantri Bhawantar Bhuktan Yojana*” which intended to protect farmers against fall in prices of crop produce in APMCs. It was piloted in *kharif* 2017. The scheme covered soybean, ground nut, sesame, maize, green gram, black gram, and red gram which were not under procurement by government bodies. The registered farmers were supposed to sell the crop through APMCs in the state and any shortfall between MSP and price received by farmer was borne by state government. This resulted in traders quoting lower prices and thus, more than fifty percent of arrivals of soybean and black gram was sold at price lower than MSP during 2017-18 period.

Table 3 provides the average price and price reported below MSP for all the years and selected crops in the study. In all the crops, growth rate of

Table 3: Year wise Average and below MSP Price in APMCs for Major Crops of Madhya Pradesh (2010-2020)
Unit: ₹/Quintal

Year	Paddy		Wheat		Soybean		Bengal Gram		Black Gram	
	Average	below MSP	Average	below MSP	Average	below MSP	Average	below MSP	Average	below MSP
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2010	1307	876	1273	1079	1986	1214	2435	1883	2402	2001
2011	1182	936	1211	1096	2113	1294	3074	2208	2512	2374
2012	1460	1043	1365	1188	2979	1686	4084	2690	3076	3021
2013	2137	1172	1612	1304	3361	1859	3085	2588	3050	3008
2014	1861	1177	1588	1351	3271	1379	2988	2533	3829	3337
2015	1724	1190	1506	1362	3409	1554	3924	3137	7893	3240
2016	1813	1301	1664	1504	3141	2494	5647	3483	6478	4288
2017	2144	1410	1682	1504	2709	2666	5164	3326	2997	2912
2018	2396	1525	1802	1590	3174	3060	3722	3474	3351	3228
2019	2078	1537	1915	1686	3446	3204	4030	3914	3973	3754
2020	2224	1620	1616	1716	3789	3499	4150	3965	5098	4538
Growth Rate (%)	5.38	5.93	3.52	4.75	4.04	10.84	4.29	6.63	5.08	5.49

price reported below MSP had been higher than the average price in Madhya Pradesh. In comparison to growth rate of MSP (Table 3), paddy, wheat, soybean had higher growth of price reported below MSP than growth rate of MSP while Bengal gram and black gram had lower growth rate of price reported below MSP than MSP growth rate. Perusal of data further reveals that at many instances over the years and across the crops decline in average does not necessarily results in decline below MSP price while an increase in average price results in increase in below MSP price.

Fig. 1 shows the average price vs. price reported below MSP plot for selected crops under study for period 2010-2020. From the Fig. 1, it can be observed that black gram and bengal gram have very wide distribution of average price for every value of price reported below MSP. In contrast, soybean average price had less dispersion and paddy and wheat price had negligible dispersion in comparison to black gram and Bengal gram. The price of chick pea was found to be highest in the lean season, which is 102 per cent more that the average price, Narwariya et al. (2015). This finding shows that pulse producers faced greater risk of receiving price below MSP when the market had potential to offer higher price than MSP. Wheat and paddy showed less dispersion on account of procurement by government in the state.

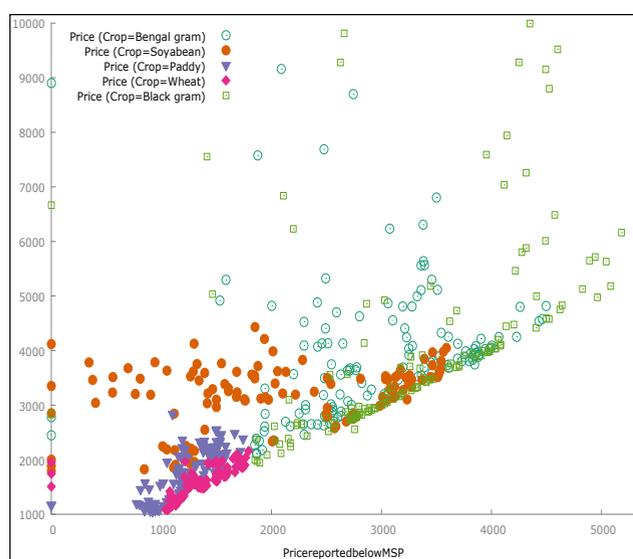


Fig. 1: Distribution of Average Price vs. Price reported below MSP for Madhya Pradesh (2010-2020)

However, to confirm the degree of linear association, correlation structure is presented in Table 4. All

correlation coefficient presented in the table are significantly different from zero at five percent level of significance. In accordance with theory, average price has negative relationship with arrivals in APMC. Price had very weak negative linear relationship with percentage of arrivals sold below MSP while strong and positive linear relationship with MSP and Price reported below MSP. Price had moderate and positive linear relationship with percentage difference of Price below MSP. Since all percentage difference between price reported below MSP & MSP and MSP were negative, it is imperative that a negative correlation coefficient should be a sign of positive relationship.

Table 4: Correlation matrix of variables in the study

Variables	Price	Arrival	% of Arrivals Sold below MSP	MSP	Price reported below MSP	% Difference of Price reported below from MSP
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Price (₹/ quintal)	1.00	-0.25	-0.02	0.75	0.67	-0.28
Arrival (Tonnes)		1.00	-0.20	-0.29	-0.23	0.16
% of Arrivals sold below MSP			1.00	0.45	0.44	-0.14
MSP (₹/ quintal)				1.00	0.88	-0.38
Price reported below MSP (₹/ quintal)					1.00	-0.06

Note: 5% critical value (two-tailed) = 0.0763 for n = 660.

Arrivals were negatively related with percentage of arrivals sold below MSP, MSP, price reported below MSP and percentage difference between price reported below MSP and MSP. Among these relationships, it must be noted that negative relationship between arrivals and MSP is on account of procurement effect; Government procurement does not count as arrivals to APMCs. Percentage of arrivals sold below MSP had moderately and positive linear relationship with MSP, Price reported below MSP and percentage difference between price reported below MSP & MSP. Price reported below

MSP had strong and positive linear relationship with MSP. However, degree of linear association does not provide with direction of relationship involved and hence, regression analysis was performed and results of regression are provided in Table 5.

Table 5: Regression analysis for factors affecting price difference from MSP and share of arrivals sold below MSP

Regressors	% Arrivals sold below MSP	Significance code	% Difference of price reported below from MSP	Significance code
(1)	(2)	(3)	(4)	(5)
Const	-2941.420	***	-1109.460	**
Price	-0.021	***	2.28E-04	
Arrival	-2.26126e-06		4.08E-07	
Year	1.492	***	0.543	**
MSP	0.018	***	-0.003	**
D_January	2.645		1.269	
D_February	4.298		-2.002	
D_March	5.718		-1.989	
D_April	4.373		-1.450	
D_May	4.645		-3.718	
D_June	8.230	*	-3.878	*
D_July	10.402	**	-2.090	
D_August	5.377		-0.618	
D_September	3.490		-0.693	
D_October	4.862		-0.459	
D_November	0.223		0.649	
D_Bengal gram	-2.439		9.421	***
D_Soybean	-31.577	***	1.098	
D_Paddy	-32.836	***	7.080	*
D_Wheat	-39.644	***	11.536	***
Mean dependent var	35.653		-18.294	
Adjusted R-squared	0.540		0.245	
Sample size	660		660	

From Table 5, it can be observed that MSP had positive and statistically significant coefficient for percentage of arrivals sold below MSP and negative and statistically significant for percentage difference of price reported below MSP. In case of former, raising MSP would increase the share of arrivals sold below MSP and would increase percent difference between price reported below MSP and MSP when other variables are held constant. Price

of the commodity had significant and negative coefficient for share of arrivals sold below MSP but had no significant effect on price difference. Total arrivals in the APMCs had no significant effect on both the dependent variables. Trend coefficient (coefficient of variable Year) was significant and positive for both the dependent variable meaning that over the years share of arrivals sold below MSP and price difference from MSP has increased and may continue to increase if other factors remains constant. Among all month dummies, only June month dummy variable had significant and positive coefficient for both dependent variables while July had significant coefficient for percentage of arrivals sold below MSP. Dummy variables like December month and black gram dummy was the benchmark category. While Bengal gram had no significant difference from black gram in respect of share of arrivals sold below MSP but had significantly lower price difference from MSP. In contrast, wheat, soybean, and paddy had significantly lower share of arrivals sold below MSP (at least 33% less) but only paddy and wheat had lower price difference from MSP.

The correlation coefficient between the residuals of two regression equation was very low (0.064) which indicates that both the equations could be estimated individually without much compromise on consistency of the estimates (Table 6). The results of test for heteroscedasticity (Table 7) shows that the jointly estimated regression equations did not suffer from problem of heteroscedasticity as evidenced by p-value greater than 5 percent level of significance.

Table 6: Cross-equation Variance Co-Variance Matrix for residuals

	Equation 1	Equation 2
Equation 1	605.16	(0.064)
Equation 2	18.720	139.82

Note: Figure within the parenthesis is correlation coefficient (above the diagonal).

Table 7: Results of test for heteroscedasticity

Name of the test	Chi-square Test statistic value	p-value
Breusch-Pagan test for diagonal covariance matrix H0: Homoscedastic variance	2.73351	0.0983

CONCLUSION

The study of pattern of arrivals reported below MSP provided the trend in arrivals reported below MSP over the years. A decreasing and constant trend in arrivals sold below MSP tells us that arrivals sold below MSP are decreasing or constant but not increasing which is a good sign for agricultural markets of Madhya Pradesh. Government of India has been increasing the MSP for crop at record pace, ranging between 4.5 to 8.2 percent per annum. Despite these efforts, MSP has failed to give direction to markets. Average price in the market was found to be highly correlated with MSP but potential for price to effect share of arrivals sold below MSP and price difference from MSP was very weak if not insignificant. Negative effect of MSP on arrivals sold at price below MSP and Price reported below MSP is a matter of great concern. Given the concentration of procurement in small pockets of country and government's limit on fiscal and logistic-storage front, it is essential to modify the nature of intervention to provide support to farmers. Recently launched "Pradhan Mantri Samman Nidhi Yojana" is a flagship scheme of GOI which can be expanded in its coverage and benefit transferred to reduce the fiscal burden and leakages of procurement scheme.

REFERENCES

- Alam, S. and Alam, J. 2001. Price behaviour of rice in Bangladesh. *Indian Journal of Agricultural Marketing*, **15**(1): 20-9.
- Deshpande, R.S. and Naik, R.T. 2002. Impact of minimum support prices on agricultural economy: A study in Karnataka. *ADRT Unit, Institute for Social and Economic Change, Bangalore*, pp. 41-65.
- Deshpande, R.S. and Naik, R.T. 2004. Moon in the mirror: Farmers and Minimum Support Prices in Karnataka. *Social and economic change monographs, Institute for Social and Economic Change, Bangalore*, pp. 21-90.
- Dev, S.M. and Rao, C. 2011. Agricultural price policy, farm profitability and food security: an analysis of rice and wheat. *Economic and Political Weekly*, **44**(9): 509-521.
- Hile, R.B., Sanap, D.J. and Yadav, D.B. 2017. Trends in Arrival and Prices of Major Agricultural Commodities in APMC, Satara of Western Maharashtra. *International Journal of Tropical Agriculture*, **35**(2): 367-376.
- Latika, S., Nitu, M. and Burark, S.S. 2012. Effectiveness of price in the production of major cereals crops in Rajasthan. *Indian Journal of Agricultural Marketing*, **26**(3): 162-163.
- Navasare, D.J., Perke, D.S. and Shelke, R.D. 2018. Growth Performance of Arrivals and Prices of Sorghum, Tur, Soybean, Chickpea and Bajra in Ahmednagar District, India. *International Journal of Current Microbiology and Applied Sciences*, **7**(7): 3697-3701.
- Narwariya, R., Naik, R.N., Nandaragi, R.P., Sharma, H.O. and Narwariya, D. 2015. Analysis of market arrivals and price of chick pea (*Cicer arietinum*) in Jabalpur regulated market of Madhya Pradesh. *Ecology Environment and Conservation*, **21**: 135-140.
- Ritu, V.P., Mehta, D.P., Malik, Raj Kumar. and Nisha. 2019. Impact of Agricultural Price Policy on Major Food Crops in Haryana. *Economic Affairs*, **65**(2): 67-274.
- Singh, C.R. and Kumar, G.J. 2016. Pattern of Arrivals and Prices of Wheat in different grade Regulated Markets of Madhya Pradesh. *International Journal of Agriculture Sciences*, **8**(17): 297-1299.
- Singh, J., Garg, B.R. and Jain, K.K. 2006. An analytical study into the distribution of gains through agricultural price policy in India. *Agricultural Situation in India*, **64**(2): 289-302.
- Singh, K., Vatta, K. and Kumar, S. 2002. Effectiveness of price policy for cotton in Punjab, AERC. *Indian Journal of Agricultural Marketing*, **16**(3): 65-72.
- Singh, P., Suhag, K.S. and Jain, R. 2000. Analysis of prices and arrivals of rapeseed and mustard in Haryana. *Indian Journal of Agricultural Marketing*, **14**(2): 59-65.
- Sudhakarrao, S. and Katkade, J.L. 2015. Seasonality and volatility in arrivals and prices of oilseeds in Marathwada region of Maharashtra state, India. *Indian Journal of Agricultural Research*, **50**: 8-14.
- Suryawanshi, R.R. and Gawade, B.B. 2011. Price analysis of selected cereals in APMC, Kolhapur. A Report of research work done by the Department of agricultural economics, MPKV, Rahuri, pp. 99-108.
- Verma, D.K., Sharma, L., Singh, H., Jitendra, S. and Patil, P. 2018. Seasonal Pattern and Comparative Study of Market Arrivals of Soybean Crop in Southern Rajasthan, India. *International Journal of Current Microbiology and Applied Sciences*, **7**: 481-490.