

Forecasting the Price Trends in Major Rapeseed & Mustard (R&M) Markets of Assam

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ABSTRACT

Rapeseed & Mustard (R&M) holds a crucial position in India's oilseeds industry, with India being the largest producer by area and the third largest in production globally. The "Yellow Revolution" of the early 1990s briefly achieved self-sufficiency in oilseeds, but this was not sustained, leading to increased dependence on vegetable oil imports. In India, R&M oil constitutes about two-thirds of the country's edible oil consumption, predominantly in the *kacchi-ghani* form. Approximately 90% of the domestic Rapeseed & Mustard production is crushed for oil, primarily consumed in northern, northeastern and central India. Assam, a major R&M-producing state, faces significant productivity challenges due to various agronomic and infrastructural constraints, including reliance on traditional varieties, lack of irrigation and delayed sowing. To support mustard farmers, the Assam Government announced an MSP of ₹ 5,950 per quintal for the 2025-26 marketing season, with procurement facilitated through existing paddy centres and NAFED. This study employs ARIMA modelling in R-Software to forecast mustard prices, analyzing 10 to 17 years of time series wholesale price data from AGMARKNET and AMIU-AAU portals for four major mustard markets of Assam in Barpeta, Dhubri and Darrang districts.

Keywords: Rapeseed & Mustard, Crop Price Forecasting Assam, ARIMA Model, R-Software

Rapeseed-mustard (*Brassica juncea*) is the third most important oilseed crop worldwide, following soybean (*Glycine max*) and palm (*Elaeis guineensis*) oil. In India, among the seven edible oilseeds, rapeseed-mustard accounts for 28.6% of total oilseed production, ranking second after groundnut, which accounts for 27.8%. Oilseed production is crucial in India due to the significant gap between demand and supply, resulting in a 9% increase in vegetable oil imports during November-December 2020, reaching 24.59 lakh tonnes compared to 2019 (<https://nfsm.gov.in>). Major oilseeds in India include rapeseed (toria) and mustard, groundnut, linseed, sesame,

niger, soybean, sunflower and castor. In Assam, rapeseed and mustard are the principal oilseed crops, occupying about 8.46% of the total crop area (Statistical Handbook of Assam, 2022-23). Rapeseed-mustard holds a significant position in India's oilseeds industry. India is the largest producer of R&M in terms of area and ranks third in production globally. The "Yellow Revolution" of the early 1990s briefly achieved self-sufficiency in oilseeds, but this

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was not sustained. Despite being the fourth-largest producer of oilseeds globally, India is also one of the largest importers of vegetable oils today. Considering the production of R&M at national, state and district levels, the oil requirement is not sufficient enough for the country's growing population according to the ICAR-ATARI, Umiam, Meghalaya. Domestic oilseed production, with a Compound Annual Growth Rate of 3.89%, has not kept pace with the rapidly increasing per capita demand of approximately 6%, driven by higher population and income, leading to an annual consumption of 18 kg per capita (Borah et al. 2023). In India, R&M oil makes up about two-thirds of the country's edible oil consumption. This oil is primarily traded in its traditional *kacchi-ghani* form for its unique flavour, and to some extent in refined form. It is estimated that about 90% of the domestic mustard-rapeseed production is crushed to extract edible oil, which is mainly traded and consumed in northern, northeastern and central India.

The Assam Government's 2025-26 marketing season announcement of the Minimum Support Price (MSP) for R&M, set at ₹ 6450 per quintal, aims to empower farmers and promote second cropping. The Minimum Support Price (MSP) mandates that all purchasers, whether individuals or mill owners, pay the specified amount for mustard seeds. The Government procured mustard seeds through the existing paddy procurement centres and the National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) facilitates payments to farmers within three days of procurement. Recognizing that farmers form the backbone of the state economy; the Assam Government aims to strengthen their financial status.

The major rapeseed and mustard (R&M) producing districts in Assam include Lakhimpur, Kokrajhar, Sonitpur, Dhemaji, Dhubri, Barpeta, Nagaon, Darrang, Karbi Anglong, Jorhat, and Kamrup. These districts collectively contribute more than 70% of the total area and production of R&M in the state (Economic Survey, Assam, 2022-23). In the 2022-23 agricultural year, Barpeta district had a total cultivated area of 20,159 hectares, yielding a production of 14,793 tonnes with an average yield of 0.73 tonnes per hectare. Similarly, Darrang district covered an area of 20,163 hectares, producing 13,348

tonnes, with a yield of 0.66 tonnes per hectare. Dhubri district had the highest yield among the three, with an area of 20,253 hectares producing 19,086 tonnes, resulting in an average yield of 0.94 tonnes per hectare. These figures highlight the varying productivity levels of R&M across different districts in Assam (Directorate of Economics and Statistics, Government of India, 2023).

MATERIALS AND METHODS

To forecast the future wholesale prices of Rapeseed and Mustard Autoregressive Integrated Moving Average (ARIMA) model was selected using R software. The ARIMA model is a statistical approach for analysing and forecasting time series data popularized by Box and Jenkins (Box & Jenkins, 1976), also known as the Box-Jenkins model. The model parameters are represented as p , d and q , which define the type of ARIMA model used.

- ♦ p (AR-term): Represents the number of lag observations used to predict future values.
- ♦ d (I-term): Represents the number of times the data has been differenced to achieve stationarity.
- ♦ q (MA-term): Represents the number of lagged forecast errors used in the prediction equation.

The seasonality of the time series data was checked using the Ollech-Webel (WO) seasonality test, which combines the Quantile Spectral (QS) test and the Kruskal-Wallis (KW) test (Ollech & Webel, 2020). The QS test identifies periodicity in residuals, while the KW test evaluates differences across seasons. A p -value below 0.01 for the QS test or below 0.002 for the KW test classifies a time series as seasonal.

The ARIMA model assumes stationarity, which is tested using the Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1979). The ADF test determines whether a time series is stationary by testing the null hypothesis (H_0 : the time series is non-stationary) against the alternative hypothesis (H_A : the time series is stationary). If the p -value is below 0.05, the null hypothesis is rejected, indicating stationarity.

Steps in ARIMA Model Building

1. *Model Identification*: The Partial Autocorrelation Function (PACF) plot is used to determine

the AR-term (p), while the Autocorrelation Function (ACF) plot helps identify the MA-term (q).

2. *Model Estimation:* Once the ARIMA model structure is determined, it is estimated using the `arima()` function in R-Software, which employs Maximum Likelihood Estimation (MLE) to estimate the model parameters.
3. *Model Diagnostic Checking:* The Ljung-Box test is used to confirm that residuals exhibit white noise properties, ensuring model validity.
4. *Forecasting:* After model validation, future price values are forecasted using the ARIMA model, generating confidence intervals for the predictions.
5. *Forecast Accuracy Measures:* The Akaike Information Criterion (AIC), Root Mean Squared Error (RMSE), and Mean Absolute Percentage Error (MAPE) are employed to evaluate the model's predictive performance (Hyndman & Koehler, 2006).
6. *Comparison of Actual and Forecasted Prices:* The predicted prices are compared with actual prices obtained from the AMIU-AAU portal of Assam Agricultural University. The percentage difference between actual and forecasted prices assesses the accuracy of the model.

The objective of this study is to develop a predictive model for forecasting mustard prices for the agricultural year from July 2023 to June 2024 using ARIMA modelling and to evaluate the accuracy of the ARIMA model in predicting future wholesale prices based on historical datasets. This study does not provide future price datasets; rather, it outlines the procedures for applying the ARIMA model to generate future price forecasts. To accomplish the research objectives, the study concentrated on four major mustard markets in Assam: Howly Market in Barpeta district, Gauripur Market in Dhubri district, and Kharupetia and Besimari Markets in Darrang district. For statistical analysis, time series wholesale price data covering the last 10 to 17 years were collected from the AGMARKNET and AMIU-AAU portals. Specifically, data for Howly Market in Barpeta were available from July 2005 to June 2023, while Gauripur Market in Dhubri had data from July

2010 to June 2023. Similarly, Kharupetia Market in Darrang had records from July 2006 to June 2023, and Besimari Market in Darrang had data from July 2014 to June 2023. These extensive datasets facilitated the development of a reliable forecasting model for mustard price trends in Assam.

RESULTS AND DISCUSSION

The time series plotted in Fig. 1 illustrates the trends in wholesale mustard prices across four major markets in Assam: Barpeta (Howly Market), Dhubri (Gauripur Market), Darrang (Kharupetia Market) and Darrang (Besimari Market).

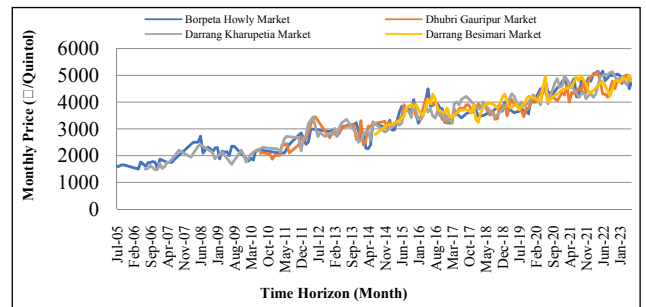


Fig. 1: Visualization of the Wholesale prices major markets of R&M in Assam

To analyze the seasonality of these time series, Ollech-Webel (WO-test) seasonality test was conducted using the R-Software. The *p*-values for each market, as determined by the WO test, presented in Table 1. Based on the table, it can be concluded that there is no seasonality in mustard prices in any of these markets, as the *p*-values are greater than 0.05.

Table 1: Ollech-Webel Test (WO-test)

Market	<i>p</i> -value
Barpeta (Howly)	1
Dhubri (Gauripur)	0.131
Darrang (Kharupetia)	1
Darrang (Besimari)	1

Source: Author's own computation.

To check the stationarity of the time series, augmented dickey fuller test was conducted. The ACF plot shown in Fig. 2 demonstrates a steady decline in autocorrelation values, suggesting that the series is non-stationary.

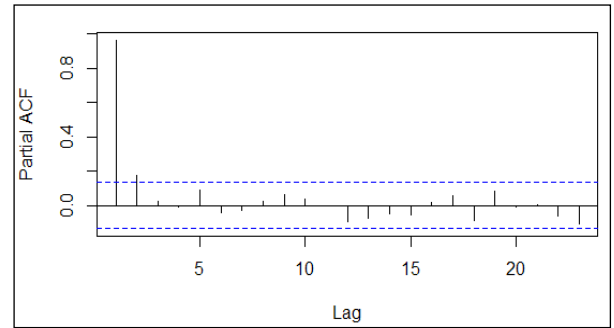
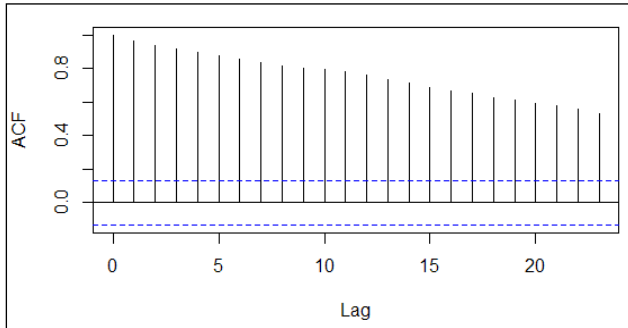


Fig. 2(a): ACF & PACF plots of Howly R&M market price series

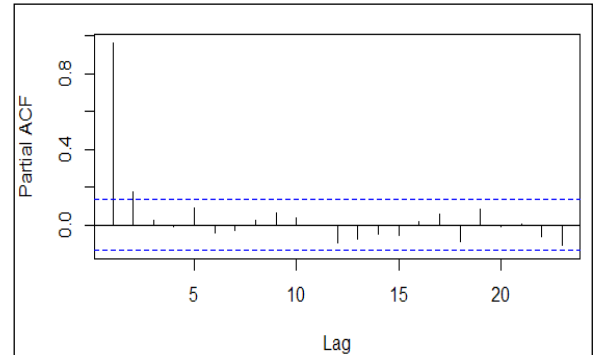
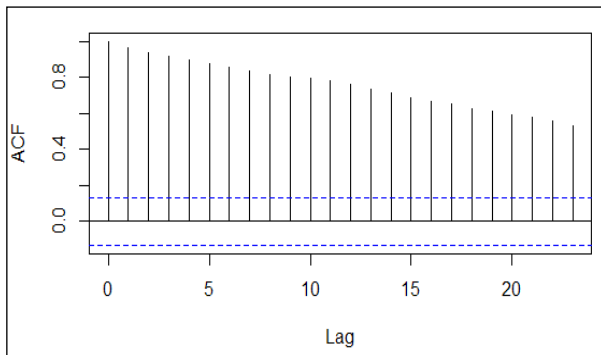


Fig. 2(b): ACF & PACF plots of Gauripur R&M market price series

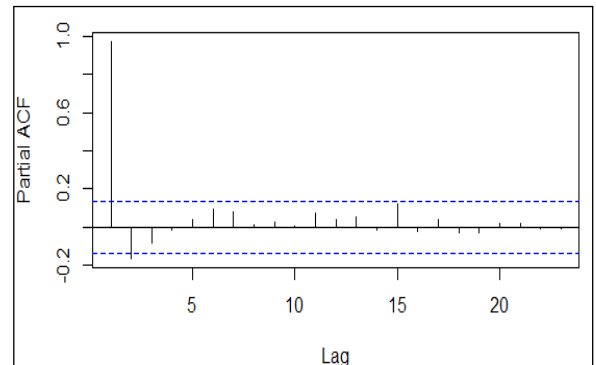
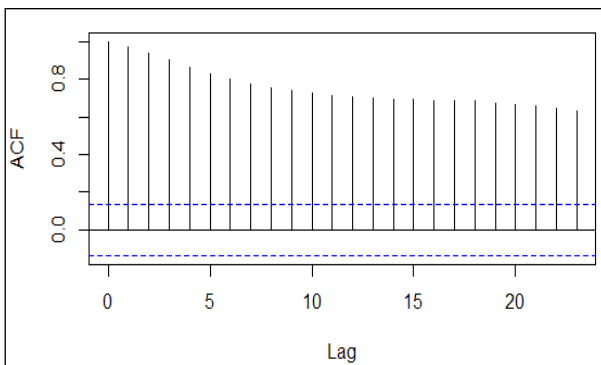


Fig. 2(c): ACF & PACF plots of Kharupetia R&M market price series

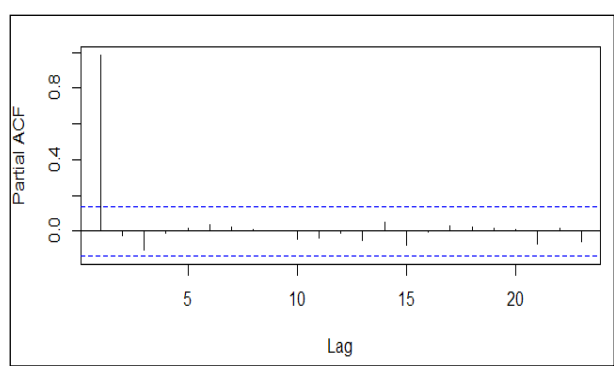
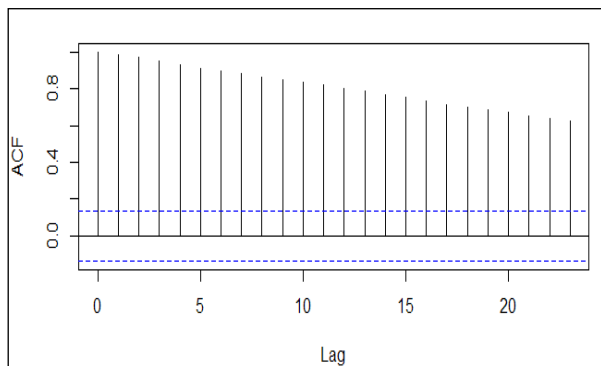


Fig. 2(d): ACF & PACF plots of Besimari R&M market price series

Fig. 2: Market Wise ACF and PACF of R&M Price Series before Differencing

To address this, the trend is eliminated by differencing the series with a lag of 1 ($d=1$), which resulted in a stationary series in terms of both mean and variance, as shown in Fig. 3.

To further validate the stationarity of the Mustard price series across the four markets, the Augmented Dickey-Fuller test was applied. The test results, displayed in Table 2, reveal statistical significance at the 5% level (p -value < 0.05) up to the fifth lag, confirming that the series is stationary and appropriate for further modelling.

Table 2: Augmented Dickey-Fuller test results for R&M markets

Market	Type	Lags	F value	p -value
Barpeta (Howly)	Single Mean	1	-12.661	0.010**
		2	-9.833	0.022**
		3	-9.375	0.013**
		4	-7.962	0.020**
		5	-7.126	0.012**
Dhubri (Gauripur)	Single Mean	1	-10.806	0.022**
		2	-7.831	0.031**
		3	-7.025	0.021**
		4	-7.216	0.011**
		5	-7.298	0.026**

Darrang (Kharupetia)	Single Mean	1	-6.978	0.012**
		2	-7.172	0.012**
		3	-7.426	0.032**
		4	-8.168	0.021**
		5	-7.381	0.013**
Darrang (Besimari)	Single Mean	1	-7.181	0.011**
		2	-6.361	0.021**
		3	-6.702	0.013**
		4	-5.974	0.012**
		5	-5.821	0.020**

** indicates 5 % level of significance.

IDENTIFICATION OF MODEL PARAMETERS

To manually determine the suitable model parameters i.e. p and q values for ARIMA model forecasting, ACF and PACF plots for the four mustard markets were generated using R-Software, as shown in Fig. 4 after differencing ($d=1$).

For example, in the PACF plot shown in Fig. 4(a), most spikes fall within the significance bounds (the blue dashed line representing the 95% confidence interval). However, two significant spikes at lags 2 and 3 exceed the threshold marked by the blue lines. Beyond lag 3, the spikes drop off to zero, indicating no strong correlation at higher lags, and

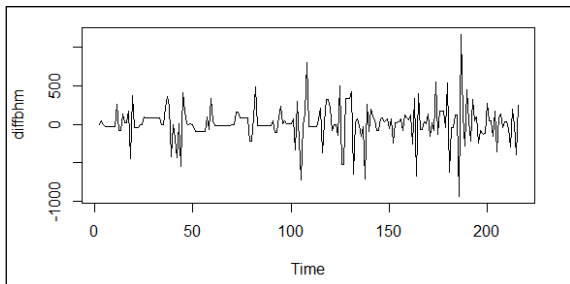


Fig. 3(a): Howly R&M Market

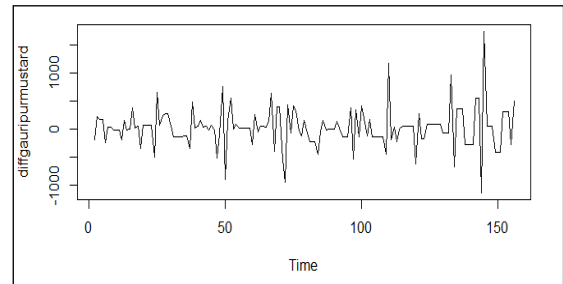


Fig. 3(b): Gauripur R&M Market

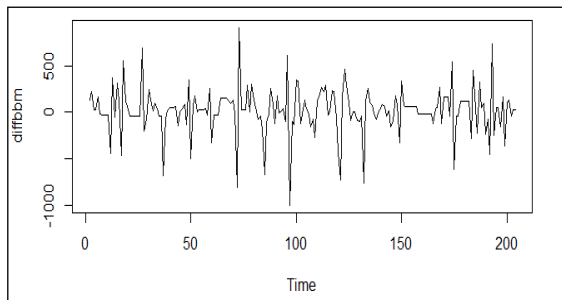


Fig. 3(c): Kharupetia R&M Market

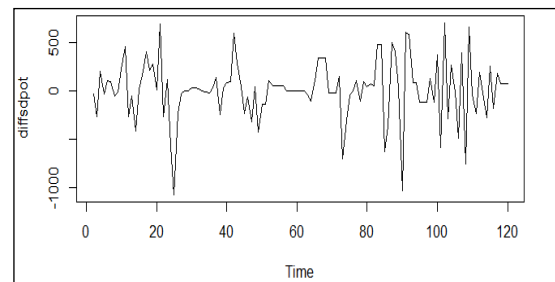


Fig. 3(d): Besimari R&M Market

Fig. 3: Graph depicting the prices of R&M markets after differencing

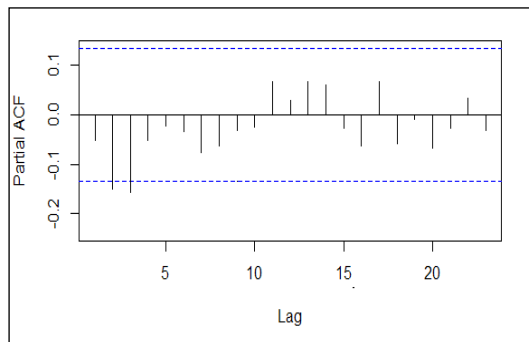
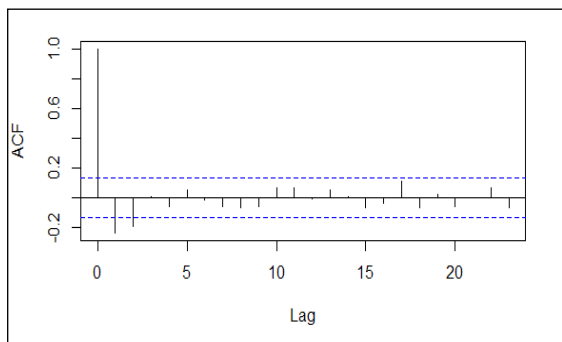


Fig. 4(a): ACF & PACF plots of Howly R&M market after differencing

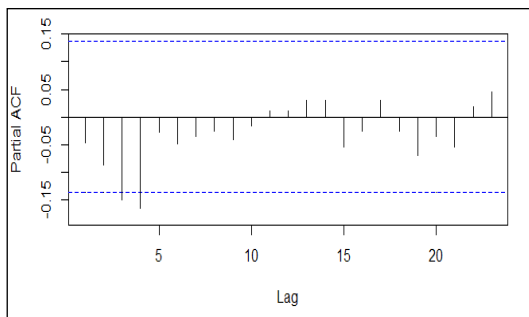
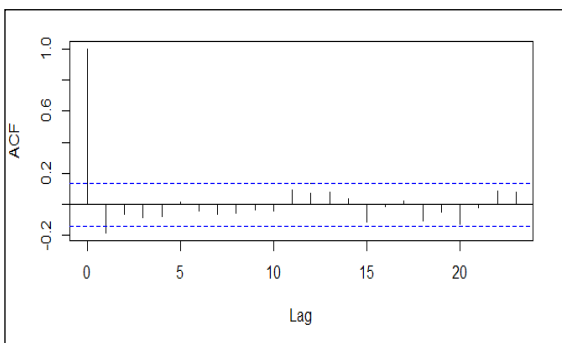


Fig. 4(b): ACF & PACF plots of Gauripur R&M market after differencing

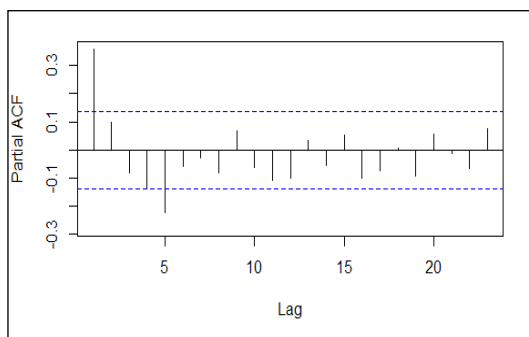
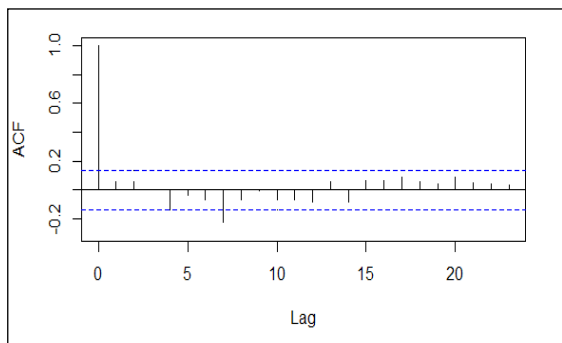


Fig. 4(c): ACF & PACF plots of Kharupetia R&M market after differencing

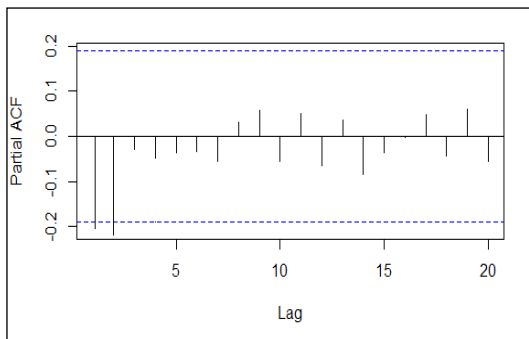
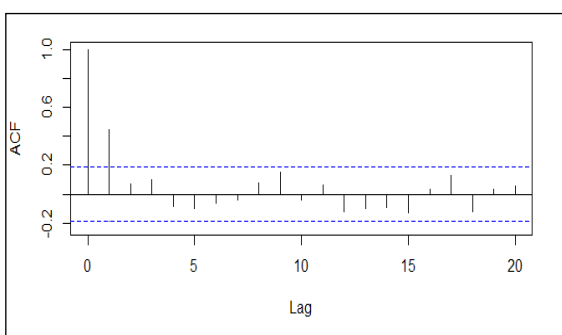


Fig. 4(d): ACF & PACF plots of Besimari R&M market after differencing

Fig. 4: ACF and PCF plot of R&M Markets after first order differencing

Table 3: Parameters of Manually Selected ARIMA Models

Market	Fitted Models	Type	Coef.	S.E.	Z-value	p-value
Barpeta (Howly)	ARIMA (3,1,2)	AR1	0.546	0.244	2.238	0.025**
		AR2	-0.338	0.126	-2.662	0.008***
		AR3	0.430	0.135	3.171	0.001***
		MA1	-0.633	0.297	-2.125	0.034**
		MA2	0.587	0.147	3.970	0.000***
Dhubri (Gauripur)	ARIMA (4,1,1)	AR1	-0.272	0.083	-3.281	0.001***
		AR2	0.176	0.063	2.789	0.005***
		AR3	0.467	0.220	2.115	0.038**
		AR4	-0.158	0.072	-2.196	0.028**
		MA1	-0.243	0.100	-2.435	0.014**
Darrang (Kharupetia)	ARIMA (5,1,7)	AR1	0.349	0.124	2.821	0.004***
		AR2	-0.152	0.070	-2.180	0.029**
		AR3	0.513	0.244	2.103	0.035**
		AR4	-0.281	0.104	-2.703	0.007***
		AR5	0.410	0.177	2.314	0.020**
		MA1	0.380	0.141	2.699	0.006***
		MA2	0.438	0.145	3.007	0.002***
		MA3	-0.692	0.246	-2.803	0.005***
Darrang (Besimari)	ARIMA (2,1,1)	MA4	0.230	0.115	2.000	0.045**
		MA5	-0.519	0.193	-2.678	0.007***
		MA6	0.190	0.087	2.189	0.029**
		MA7	-0.372	0.107	-3.477	0.013**
		AR1	-0.401	0.159	-2.514	0.012**
		AR2	0.752	0.246	3.056	0.002***
		MA1	0.521	0.264	1.967	0.000***

** and *** indicates 5 % and 1% level of significance, respectively.

suggesting an AR term of order 2 or 3. Similarly, in the ACF plot in Fig. 4(a), two significant spikes at lags 1 and 2 cross the blue lines, indicating statistical significance, while subsequent spikes drop off to zero. This suggests that an MA term of order 1 or 2 may be suitable. Consequently, the potential models for forecasting the Barpeta (Howly) mustard market include ARIMA (3,1,2), ARIMA (3,1,1), ARIMA (2,1,1), or ARIMA (2,1,2). The model that met the accuracy criteria for the Barpeta (Howly) market was ARIMA (3,1,2).

Similarly, after visually inspecting Fig. 4(b), 4(c) and 4(d) and evaluating various potential models for the Dhubri (Gauripur), Darrang (Kharupetia), and Darrang (Besimari) mustard markets, the selected

models for forecasting were ARIMA (4,1,1), ARIMA (5,1,7) and ARIMA (2,1,1), respectively, as they fulfilled the model accuracy criteria.

After the manual selection of models, the process of choosing ARIMA models for forecasting various mustard markets was refined using the 'auto.arima' function in R-software, resulting in a second set of models for further evaluation (Table 4). The software suggested ARIMA (0,1,1) for Barpeta (Howly) and Dhubri (Gauripur) R&M markets, while, ARIMA (5,1,0) for Darrang (Kharupetia) and ARIMA (1,1,1) for Darrang (Besimari) R&M markets, respectively. These software-suggested models were again used for comparison with the manually selected models.

Table 4: Parameters of the Software Selected ARIMA Models

Market	Fitted Model	Type	Coef.	S.E.	Z-value	p-value
Barpeta (Howly)	ARIMA (0,1,1)	MA1	-0.283	0.072	-3.930	0.000***
Dhubri (Gauripur)	ARIMA (0,1,1)	MA1	-0.313	0.081	-3.864	0.000***
Darrang (Kharupetia)	ARIMA (5,1,0)	AR1	0.283	0.249	1.133	0.256
		AR2	-0.561	0.298	-1.881	0.060
		AR3	0.511	0.243	2.103	0.035**
		AR4	-0.100	0.270	-0.370	0.711
		AR5	-0.103	0.226	-0.451	0.651
Darrang (Besimari)	ARIMA (1,1,1)	AR1	0.213	0.101	2.109	0.035**
		MA1	0.314	0.212	1.481	0.138

** and *** indicates 5% and 1% level of significance, respectively.

Table 5: Accuracy criterion of the fitted models

Market	Series Length	Selection Method	Model Parameters	AIC	RMSE	MAPE
Barpeta (Howly)	18 Years	Manual	ARIMA (3,1,2)	2953.99	227.80	4.85
		R-Software	ARIMA (0,1,1)	2957.56	230.21	4.95
Dhubri (Gauripur)	17 Years	Manual	ARIMA (4,1,1)	2242.26	320.86	7.13
		R-Software	ARIMA (0,1,1)	2301.33	412.59	8.11
Darrang (Kharupetia)	13 Years	Manual	ARIMA (5,1,7)	2589.37	131.61	3.29
		R-Software	ARIMA (5,1,0)	2611.28	134.33	4.19
Darrang (Besimari)	9 Years	Manual	ARIMA (2,1,1)	1382.67	148.27	2.70
		R-Software	ARIMA (1,1,1)	1383.81	152.10	2.78

Table 6: Selection of Final Models based on Model Accuracy Criterion

Market	Series Length	Model Selection	Model	AIC	RMSE	MAPE
Barpeta (Howly)	18 Years	Manual	ARIMA (3,1,2)	2953.99	227.80	4.85
Dhubri (Gauripur)	17 Years	Manual	ARIMA (4,1,1)	2242.26	320.86	7.13
Darrang (Kharupetia)	13 Years	Manual	ARIMA (5,1,7)	2589.37	131.61	3.29
Darrang (Besimari)	9 Years	Manual	ARIMA (2,1,1)	1382.67	148.27	2.70

COMPARISON OF FORECAST MODELS

In this study, AIC, RMSE and MAPE are used to evaluate model accuracy. The model with the lowest values for RMSE, AIC and MAPE is selected as the best one (Table 5).

Once a model has been fitted to the data, conducting diagnostic tests on the residuals is essential to evaluate whether the model is adequate and properly captures the data's underlying structure (Table 7). Diagnostic checks involve a combination of visual and statistical analyses to ensure that the model has removed all meaningful patterns, leaving behind random

residuals that indicate good model performance. Statistical tests, such as the Ljung-Box test, play a crucial role in confirming that the residuals are free from autocorrelation. The Ljung-Box test evaluates whether any significant autocorrelation remains in the residuals at various lags. If the test returns a p -value above the significance level (i.e. p -value > 0.05), it suggests that the residuals are independent and identically distributed, indicating that the model fits the data well. In our case also, since the p -values are greater than the chosen significance level (commonly 0.05), it can be concluded that the

Table 7: Ljung-Box Test Results for R&M Markets

Market	Fitted Model	Statistic	df	p-value
Barpeta (Howly)	ARIMA (3,1,2)	8.548	6	0.123
		15.379	12	0.823
Dhubri (Gauripur)	ARIMA (4,1,1)	5.198	6	0.311
		17.453	12	0.121
Darrang (Kharupetia)	ARIMA (5,1,7)	10.105	6	0.792
		15.210	12	0.192
Darrang (Besimari)	ARIMA (2,1,1)	9.221	6	0.121
		17.477	12	0.092

Table 8: Evaluation of Forecast for Barpeta (Howly) R&M Market

Months	Forecast ARIMA (3,1,2)	Lower Bounds (95% C.I.)	Higher Bounds (95% C.I.)	Lower Bounds (99% C.I.)	Higher Bounds (99% C.I.)
July-23	4742.16	4289.34	5194.98	4147.05	5337.26
Aug-23	4742.49	4183.83	5301.16	4008.28	5476.71
Sept-23	4765.03	4136.11	5393.96	3938.49	5591.58
Oct-23	4756.98	4066.08	5447.88	3848.99	5664.98
Nov-23	4771.08	4034.93	5507.23	3803.62	5738.54
Dec-23	4764.77	3984.38	5545.17	3739.16	5790.39
Jan-24	4773.13	3956.38	5589.88	3699.74	5846.53
Feb-24	4768.70	3915.71	5621.69	3647.68	5889.72
Mar-24	4773.72	3888.75	5658.67	3610.68	5936.75
April-24	4770.71	3853.86	5687.56	3565.78	5975.66
May-24	4773.77	3827.60	5719.93	3530.29	6017.24
June-24	4771.78	3796.48	5747.08	3490.01	6053.55

C.I.: Confidence Interval.

residuals are independent, indicating negligible autocorrelation within the specified lag (Table 7).

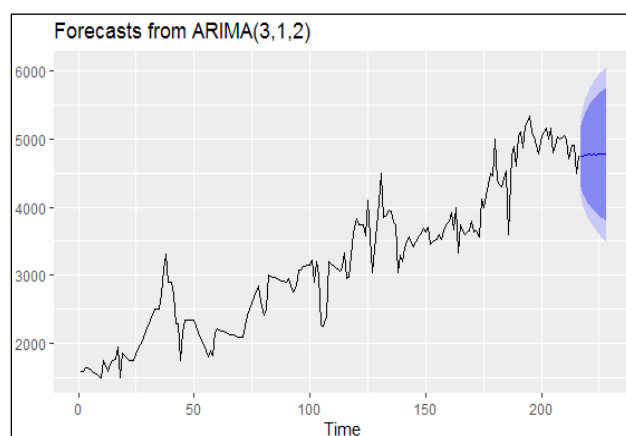
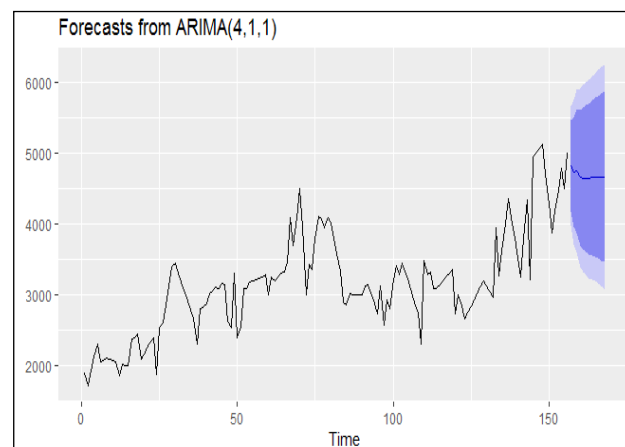
**Fig. 5:** Forecast based on the fitted ARIMA (3,1,2) model for Barpeta (Howly) market**Fig. 6:** Forecast based on the fitted ARIMA (4,1,1) model for Dhubri (Gauripur) Market

Table 9: Evaluation of Forecast for Dhubri (Gauripur) R&M Market

Months	Forecast ARIMA (4,1,1)	Lower Bounds (95% C.I.)	Higher Bounds (95% C.I.)	Lower Bounds (99% C.I.)	Higher Bounds (99% C.I.)
July-23	4819.63	4178.30	5460.95	3976.78	5662.47
Aug-23	4736.17	3967.54	5504.81	3726.02	5746.33
Sept-23	4754.80	3884.43	5625.16	3610.95	5898.65
Oct-23	4656.1	3695.99	5616.21	3394.30	5917.89
Nov-23	4647.22	3647.71	5646.73	3333.64	5960.81
Dec-23	4648.30	3614.36	5682.25	3289.47	6007.14
Jan-24	4640.14	3576.97	5703.31	3242.89	6037.38
Feb-24	4654.30	3565.63	5742.97	3223.55	6085.05
Mar-24	4660.72	3543.89	5777.55	3192.95	6128.49
April-24	4664.35	3518.69	5810.02	3158.70	6170.01
May-24	4668.62	3493.36	5843.88	3124.07	6213.17
June-24	4668.48	3462.94	5874.02	3084.14	6252.83

C.I.: Confidence Interval.

Table 10: Evaluation of Forecast for Darrang (Kharuprtia) R&M Market

Months	Forecast ARIMA (5,1,7)	Lower Bounds (95% C.I.)	Higher Bounds (95% C.I.)	Lower Bounds (99% C.I.)	Higher Bounds (99% C.I.)
July-23	4931.69	4663.95	5199.44	4579.82	5283.57
Aug-23	4954.43	4521.45	5387.40	4385.40	5523.45
Sept-23	4967.58	4368.44	5566.72	4180.18	5754.98
Oct-23	4945.26	4216.18	5674.35	3987.08	5903.45
Nov-23	4922.98	4092.82	5753.15	3831.95	6014.00
Dec-23	4876.38	3984.11	5768.65	3703.74	6049.02
Jan-24	4836.14	3902.76	5769.52	3609.47	6062.81
Feb-24	4840.41	3886.16	5794.64	3586.32	6094.49
Mar-24	4844.91	3875.13	5814.68	3570.41	6119.40
April-24	4830.18	3842.01	5818.35	3531.51	6128.85
May-24	4834.47	3829.54	5839.41	3513.76	6155.17
June-24	4849.94	3830.51	5869.37	3510.18	6189.69

C.I.: Confidence Interval.

Table 11: Evaluation of Forecast for Darrang (Besimari) R&M Market

Months	Forecast ARIMA (2,1,1)	Lower Bounds (95% C.I.)	Higher Bounds (95% C.I.)	Lower Bounds (99% C.I.)	Higher Bounds (99% C.I.)
July-23	5047.86	4751.71	5344.00	4658.66	5437.06
Aug-23	4966.94	4512.69	5421.19	4369.94	5563.93
Sept-23	4893.22	4347.26	5439.19	4175.71	5610.74
Oct-23	4848.99	4248.24	5449.75	4059.47	5638.51
Nov-23	4829.76	4191.78	5467.74	3991.32	5668.21
Dec-23	4824.93	4157.25	5492.61	3947.45	5702.41
Jan-24	4826.08	4131.62	5520.53	3913.41	5738.74
Feb-24	4828.53	4108.37	5548.69	3882.09	5774.97
Mar-24	4830.45	4085.11	5575.79	3850.91	5810.00
April-24	4831.50	4061.44	5601.57	3819.47	5843.55
May-24	4831.92	4037.68	5626.15	3788.12	5875.71
June-24	4832.00	4014.20	5649.77	3757.24	5906.74

C.I.: Confidence Interval.

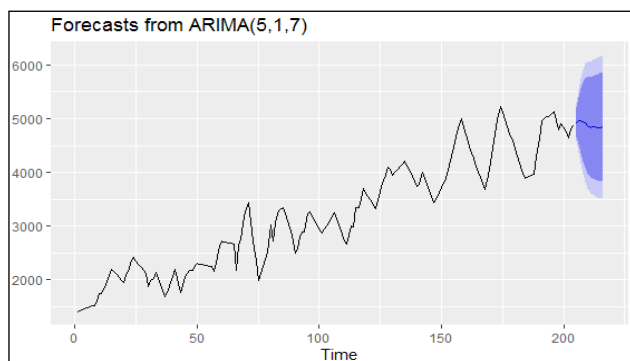


Fig. 7: Forecast based on the fitted ARIMA (5,1,7) model for Darrang (Kharupetia) Market

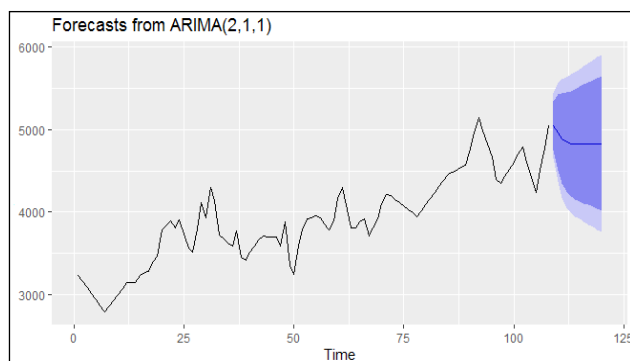


Fig. 8: Forecast based on the fitted ARIMA (2,1,1) model for Darrang (Besimari) Market

CONCLUSION

In conclusion, rapeseed-mustard plays a vital role in India's oilseed sector, particularly in Assam, where it is a major crop. Despite its significance, production remains insufficient to meet the rising demand, leading to increased reliance on imports. Government initiatives such as the Minimum Support Price (MSP) and procurement strategies aim to support farmers and enhance production. However, addressing agronomic challenges and improving productivity across key mustard-producing districts is essential for achieving long-term self-sufficiency in edible oil production.

LIMITATIONS

The differences between actual and forecasted mustard prices in Assam markets arise from several factors. Fluctuations in supply and demand, unexpected weather conditions, and government interventions can cause price deviations. Sudden policy changes, speculative trading, and market sentiment also contribute to price volatility. These elements together lead to variations that the ARIMA model may not fully capture.

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