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Single Exponential Smoothing for Forecasting Medium Rice Retail Prices in Lampung Province

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ABSTRACT

Forecasting the price of medium grade rice is a strategic effort to support decision-making in maintaining food price stability in Lampung Province. This study aims to apply the Single Exponential Smoothing (SES) method in forecasting medium grade rice's retail price in 2023 by evaluating the performance of the model using Mean Absolute Error (MAE). The data used is monthly retail price data for medium grade rice obtained from Dinas Ketahanan Pangan, Tanaman Pangan, dan Horticultura of Lampung Province. To obtain optimal forecasting results, the forecasting process involves determining the smoothing factor (α) parameters. The results show that the SES method can provide accurate forecasting with low MAE values. These findings suggest that the Single Exponential Smoothing method is feasible to be applied as a tool in food price control and policy planning in Lampung province.

INTRODUCTION

Indonesia is a rice-producing country as the majority of its people consume rice as their staple food. Rice in Indonesia is classified into three types, namely premium grade rice, medium grade rice, and special grade rice (Akiyama, 2016; Dawe, 2016; Suryadi et al., 2016). Medium grade rice is rice that has a maximum of 25% broken grains, premium grade rice is rice that has a maximum of 15% broken grains, while special grade rice is rice that has a different shape or colour from rice in general (Utami et al., 2023). Medium grade rice is consumed more by Indonesians compared to premium and special rice. The results of a survey by the Badan Pusat Statistik (BPS) in 2017 showed that the per capita consumption per week of rice in Indonesia was 1,62 kg to 1,73 kg (BPS, 2017). Food is a basic human need that has to be fulfilled every day. According to Rahman (2023), for rice needs to be met, it is necessary to monitor and supervise the prices of necessities. By supervising rice

prices, it is expected that the ability to purchase rice by consumers will be increased (Rahman, 2023).

To realize the determination of rice prices, the government formulated a policy limiting the selling price of rice in the Minister of Trade Regulation Number 57/M DAG/PER/8/2017 about the Determination of the Highest Retail Price Policy for Rice, which was made on August 24, 2017, and began to be applied to every retail rice seller in September 2017. This highest retail price policy aims to maintain rice price stability, establish certainty in rice prices and maintain the affordability of rice consumer purchases. This article analyzes the retail price of medium-grade rice in Lampung province using the Single Exponential Smoothing method and compares it with data from Dinas Ketahanan Pangan, Tanaman Pangan, and Hortikultura. This article analyzes the retail price of medium-grade rice in Lampung Province using the Single Exponential Smoothing (SES) method and compares the forecasting results with data from the Dinas Ketahanan Pangan, Tanaman Pangan, dan Hortikultura. SES was selected because it is suitable for forecasting short-term data with relatively stable patterns and is simple to implement. In addition to SES, other forecasting methods such as Double Exponential Smoothing (DES) and Autoregressive Integrated Moving Average (ARIMA) are also widely used in price forecasting studies (Marpaung et al., 2019; Nazim & Afthanorhan, 2024). DES is generally applied to data with trend patterns, while ARIMA is effective for more complex time-series data (LaViola, 2023; Restyana et al., 2021). However, this study focuses on SES because the rice price data used in this research tend to show stable fluctuations without significant trends, making SES an appropriate method for the forecasting process.

The Single Exponential Smoothing (SES) method is simple and easy to apply. It only requires two main components: historical data and smoothing parameters (α). SES does not require a large amount of data or complicated model settings, making it suitable for short-term forecasting with limited data (Maysofa et al., 2023). Karmaker (2017) also applied a similar method in their research on forecasting food commodity prices, including rice, in West Java Province. Their study showed that the Single Exponential Smoothing method provides accurate and useful results for food price regulation policies. In addition, the SES method is appropriate when the data does not exhibit strong trend or seasonal patterns (Karmaker, 2017).

However, despite its advantages, SES also has several limitations. The method is less effective for data that contain clear trends, seasonal patterns, or cyclical fluctuations because SES only considers the current level of the data without accounting for trend and seasonality components (Debnath & Mourshed, 2018; Gustriansyah et al., 2019; Petropoulos et al., 2022). As a result, forecasting accuracy may decrease when rice prices experience long-term upward or downward trends or seasonal changes caused by harvest periods, weather conditions, or market demand fluctuations (Cadenas et al., 2020). Therefore, SES is more suitable for short-term forecasting with relatively stable data patterns, while more complex methods such as Double Exponential Smoothing (DES) or ARIMA may provide better results for data with stronger trend and seasonal characteristics (Chukwulozie et al., 2017; Fahrudin et al., 2021; Hansun, 2024).

In addition, a study by Aziza (2022) on rice price forecasting in South Sumatera using a similar approach showed that forecasting methods such as Exponential Smoothing are very helpful in anticipating price fluctuations, especially during the harvest season when the stability of rice prices can be affected (Aziza, 2022). The SES method has a smoothing parameter (α), which determines the suitability of the forecast to the latest data. The α value ranges between 0 and 1. If α is close to 1, the model is more responsive to recent data

changes (giving more weight to the latest data) (Ahmar et al., 2021).

However, previous studies generally focused only on the application of SES for forecasting accuracy without specifically evaluating its relationship to government price stabilization policies, such as the Highest Retail Price policy. In addition, most previous research was conducted in other regions with different market characteristics and rice distribution systems. Limited studies have specifically analyzed medium-grade rice prices in Lampung Province using SES while simultaneously examining the effectiveness of government policies in maintaining price stability. Therefore, this study seeks to fill this research gap by applying the SES method to forecast medium-grade rice prices in Lampung Province and evaluating how the forecasting results can support the assessment of HET policy effectiveness and food price stabilization efforts.

The use of the SES method can help measure the impact of price policies, such as the Highest Retail Price implemented by the Lampung Provincial Government. This method plays a role in assessing whether the implemented policies are effective in maintaining the stability of medium-grade rice prices in Lampung Province. For instance, if rice prices experience an unusual increase, the forecasting model can provide an early indication of possible price trends, enabling authorities to take appropriate action (Risteski et al., 2024). Therefore, this study aims to evaluate the effectiveness of the highest retail price policy on the price stability of medium-grade rice in Lampung Province through price forecasting using the Single Exponential Smoothing (SES) method.

METHODS

The research data used is data on the Retail Price of Medium-Grade Rice in Lampung Province in 2023 obtained from the Dinas Ketahanan Pangan, Tanaman Pangan, and Hortikultura of Lampung Province, which is presented in the Table 1.

Table 1. Retail Price of Medium Grade Rice in Lampung Province in 2023

Month	Retail Price of Medium Grade Rice (Rupiah)
January	11.110
February	11.216
March	11.199
April	11.244
May	11.153
June	11.130
July	11.238
August	11.451
September	12.568
October	12.791
November	12.722

December	12.788

The method used to perform Single Exponential Smoothing is as follows.

1. Set parameters α = 0,1.
2. Calculate forecasting S_t with the formula

$$S_t = \alpha X_t + (1 - \alpha) S_{t-1}$$

where
S_t : forecast for period t
X_t : period t data value
α : the weight indicating the smoothing constant $0 < \alpha < 1$
S_{t-1} : forecast for period $t - 1$.

3. Calculate the forecasting error using the Mean Absolute Error (MAE) formula

$$MAE = \frac{\Sigma |X_t - S_t|}{n}$$

where
X_t = data in period t
S_t = forecasting value in period t
n = the number of forecasting periods involved.

4. Plot the actual price and the forecast price.
5. Set parameters α = 0,2 and repeating steps 2-4 until the parameters α = 0,9.

RESULT AND DISCUSSIONS

The following is data on the retail price of medium-grade rice in Lampung province in 2023 as presented in the Figure 1.

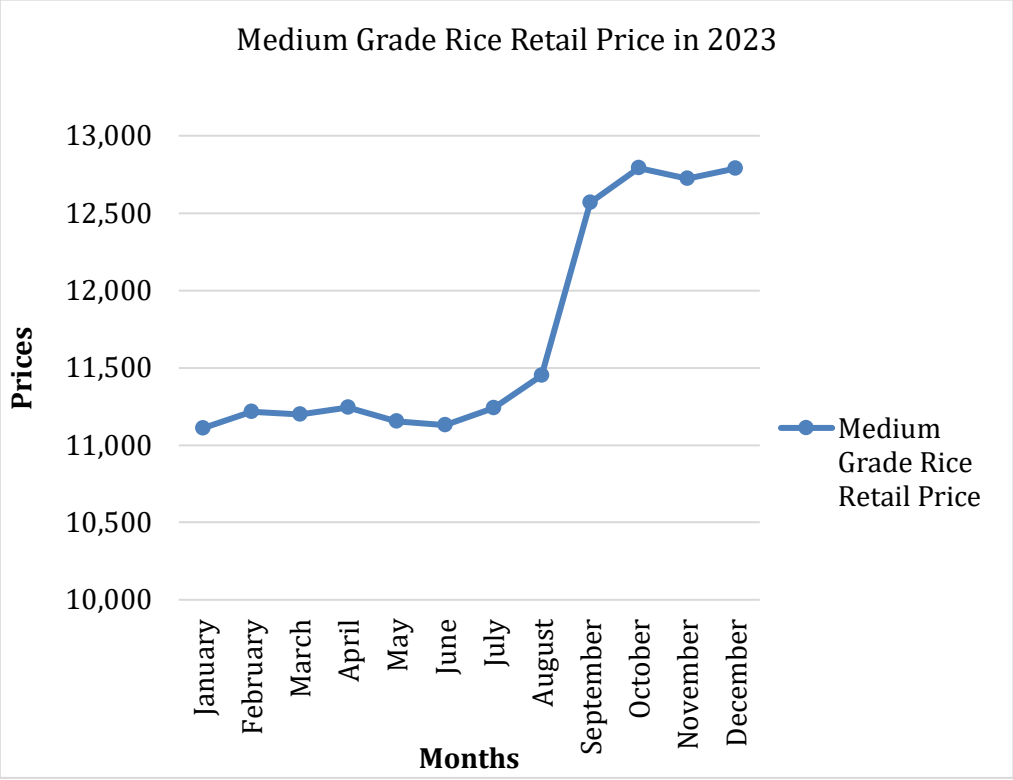

Figure 1. Graph of Medium Grade Rice Retail Price in Lampung Province 2023

It can be seen in Figure 1 that the Data of Medium Grade Rice Retail Price in Lampung Province in 2023 has experienced an erratic increase and decrease from time to time. So the data is stationary data. Thus, the Single Exponential Smoothing method is feasible in determining the forecast or prediction of the Medium Grade Rice Retail Price in Lampung province in 2023.

Single Exponential Smoothing with $\alpha = 0,1$

The following are the results of Single Exponential Smoothing forecasting with $\alpha = 0,1$.

Table 2. Forecasting Results with $\alpha = 0,1$

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0
February	11.216	11.120,6	95,4	95,4
March	11.199	11.128,44	70,56	70,56
April	11.244	11.140	104,004	104,004
May	11.153	11.141,3	11,7036	11,7036
June	11.130	11.140,17	-10,1668	10,1668
July	11.238	11.149,95	88,04992	88,04992
August	11.451	11.180,06	270,9449	270,9449
September	12.568	11.318,85	1.249,15	1.249,15
October	12.791	11.466,06	1.324,935	1.324,935
November	12.722	11.591,66	1.130,342	1.130,342
December	12.788	11.711,29	1.076,708	1.076,708

Based on Table 2, it appears that with $\alpha = 0,1$ with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 11.711,29. Next is to calculate the MAE value for $\alpha = 0,1$ is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{5.411,63}{12} = 450,97.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0{,}1 \times 12.788 + (1 - 0{,}1)11.711{,}29 = \text{Rp } 11.818{,}96.$$

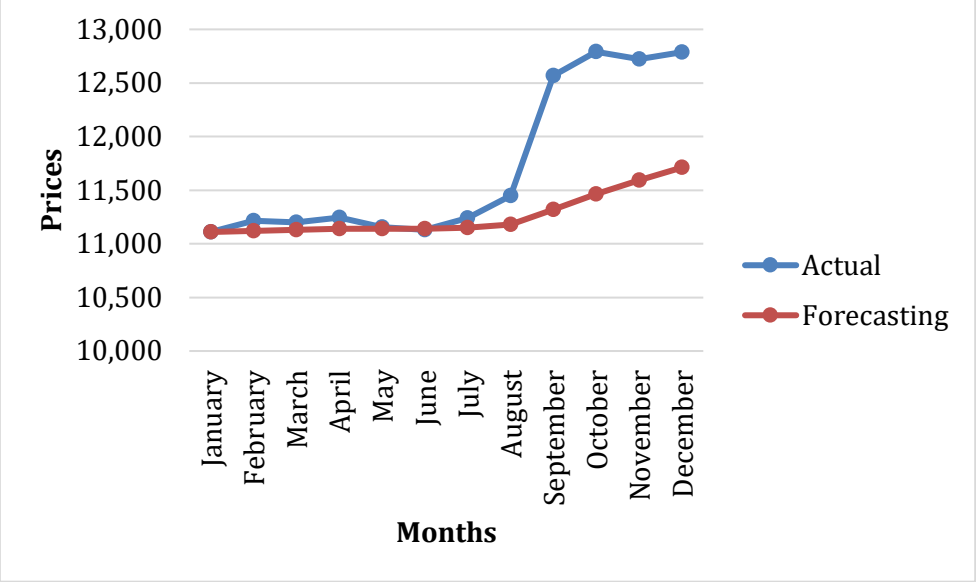

Figure 2. Graph of Forecast Data with α = 0,1

Single Exponential Smoothing with $\alpha = 0,2$

The following are the results of Single Exponential Smoothing forecasting with α = 0,2.

Table 3. Forecasting Results with α = 0,2

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0
February	11.216	11.131,2	84,8	84,8
March	11.199	11.144,76	54,24	54,24
April	11.244	11.164,61	79,392	79,392
May	11.153	11.162,29	-9,2864	9,2864
June	11.130	11.155,83	-25,8291	25,8291
July	11.238	11.172,26	65,7367	65,7367
August	11.451	11.228,01	222,9894	222,989
September	12.568	11.496,01	1.071,991	1.071,99
October	12.791	11.755,01	1.035,993	1.035,99
November	12.722	11.948,41	773,5946	773,595
December	12.788	12.116,32	671,6756	671,676

Based on Table 3, it appears that with α = 0,2 with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 12.116,32. Next is to calculate the MAE value for α = 0,2 is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{4.025}{12} = 335{,}42.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0{,}2 \times 12.788 + (1 - 0{,}2)12.116{,}32 = \text{Rp } 12.250{,}66.$$

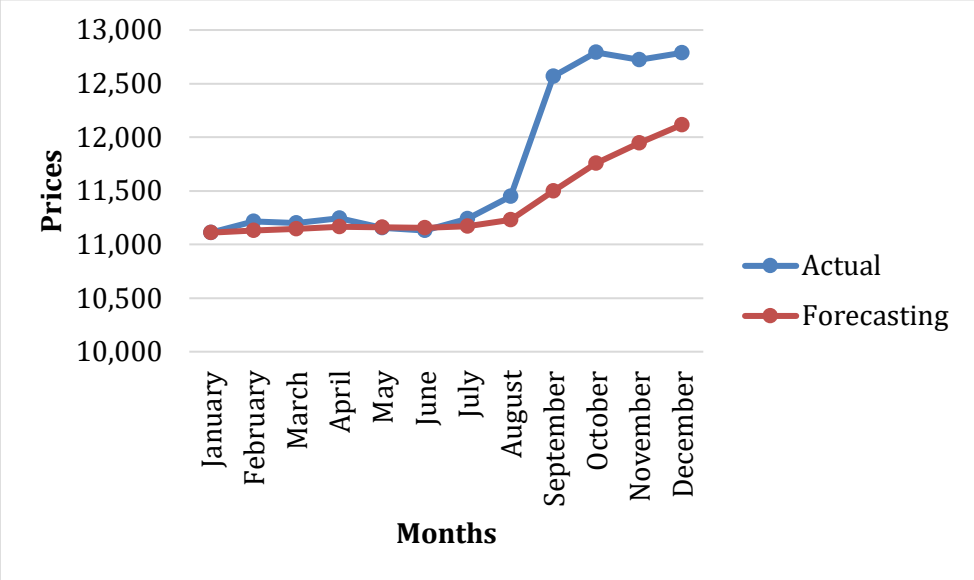

Figure 3. Graph of Forecast Data with α = 0,2

Single Exponential Smoothing with $\alpha = 0,3$

The following are the results of Single Exponential Smoothing forecasting with α = 0,3.

Table 4. Forecasting Results with α = 0,3

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0
February	11.216	11.141,8	74,2	74,2
March	11.199	11.158,96	40,04	40,04
April	11.244	11.184,47	59,528	59,528
May	11.153	11.175,03	-22,0304	22,0304
June	11.130	11.161,52	-31,5213	31,5213
July	11.238	11.184,46	53,5351	53,5351
August	11.451	11.264,43	186,5746	186,5746

September	12.568	11.655,5	912,5022	912,5022
October	12.791	11.996,15	794,8515	794,8515
November	12.722	12.213,9	508,0961	508,0961
December	12.788	12.386,13	401,8673	401,8673

Based on Table 4, it appears that with α = 0,3 with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 12.386,13. Next is to calculate the MAE value for α = 0,3 is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{2.977,64}{12} = 248,14.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0,3 \times 12.788 + (1 - 0,3)12.386,13 = \text{Rp } 12.506,69.$$

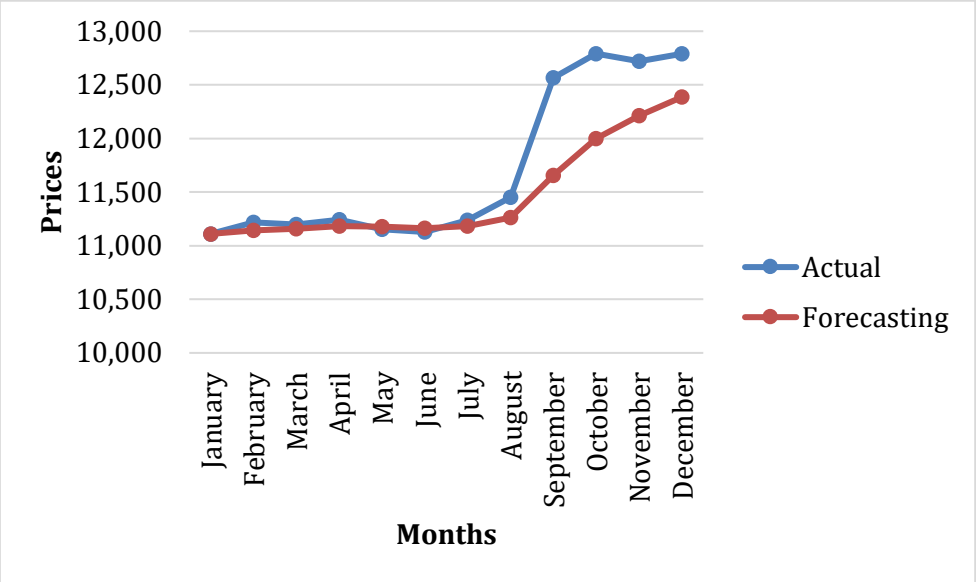

Figure 4. Graph of Forecast Data with α = 0,3

Single Exponential Smoothing with $\alpha = 0,4$

The following are the results of Single Exponential Smoothing forecasting with α = 0,4.

Table 5. Forecasting Results with α = 0,4

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0
February	11.216	11.152,4	63,6	63,3
March	11.199	11.171,04	27,96	27,96
April	11.244	11.200,22	43,776	43,776

May	11.153	11.181,33	-28,3344	28,3344
June	11.130	11.160,8	-30,8006	30,8006
July	11.238	11.191,68	46,31962	46,31962
August	11.451	11.295,41	155,5918	155,5918
September	12.568	11.804,44	763,5551	763,5551
October	12.791	12.199,07	591,933	591,933
November	12.722	12.408,24	313,7598	313,7598
December	12.788	12.560,14	227,8559	227,8559

Based on Table 5, it appears that with $\alpha = 0{,}4$ with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 12.560,14. Next is to calculate the MAE value for $\alpha = 0{,}4$ is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{2.175{,}22}{12} = 181{,}27.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0{,}4 \times 12.788 + (1 - 0{,}4)12.560{,}14 = \text{Rp } 12.651{,}28.$$

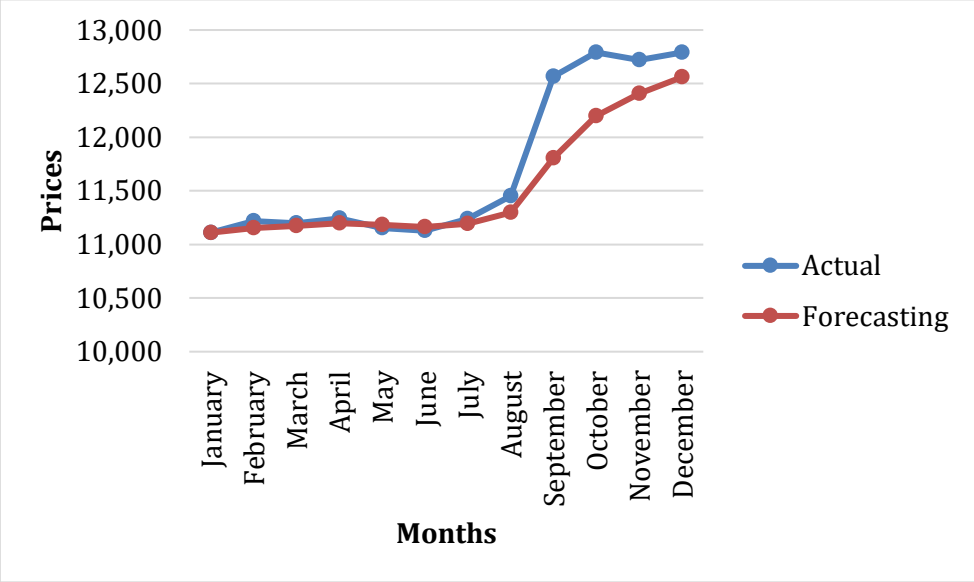

Figure 5. Graph of Forecast Data with $\alpha = 0{,}4$

Single Exponential Smoothing with $\alpha = 0,5$

The following are the results of Single Exponential Smoothing forecasting with $\alpha = 0{,}5$.

Table 6. Forecasting Results with $\alpha = 0{,}5$

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0

February	11.216	11.163	53	53
March	11.199	11.181	18	18
April	11.244	11.212,5	31,5	31,5
May	11.153	11.182,75	-29,75	29,75
June	11.130	11.156,38	-26,375	26,375
July	11.238	11.197,19	40,8125	40,8125
August	11.451	11.324,09	126,9063	126,9063
September	12.568	11.946,05	621,9531	621,9531
October	12.791	12.368,52	422,4766	422,4766
November	12.722	12.545,26	176,7383	176,7383
December	12.788	12666,63	121,3691	121,3691

Based on Table 6, it appears that with $\alpha = 0{,}5$ with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 12.666,63. Next is to calculate the MAE value for $\alpha = 0{,}5$ is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{1.556{,}63}{12} = 129{,}72.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0{,}5 \times 12.788 + (1 - 0{,}5)12.666{,}63 = \text{Rp } 12.727{,}32.$$

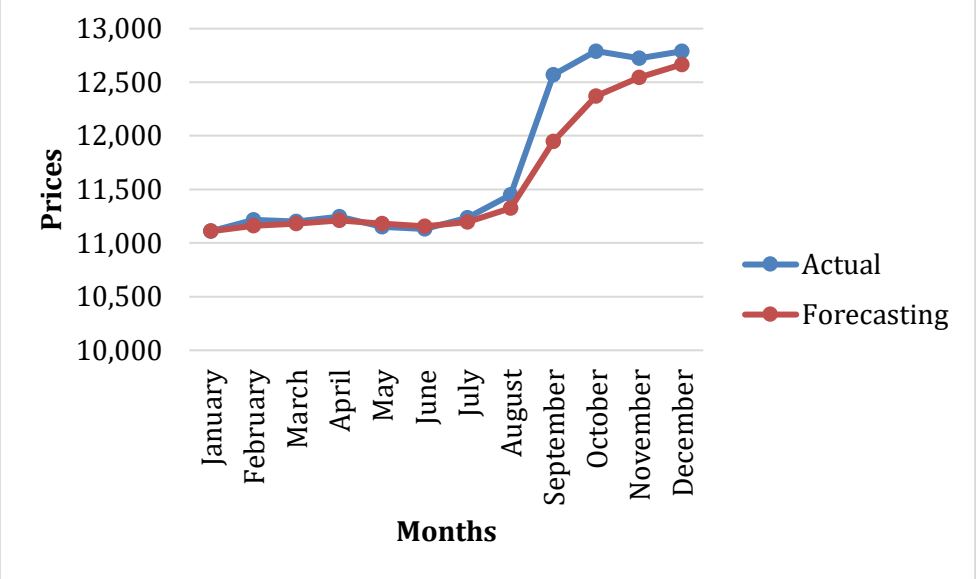

Figure 6. Graph of Forecast Data with $\alpha = 0{,}5$

Single Exponential Smoothing with $\alpha = 0,6$

The following are the results of Single Exponential Smoothing forecasting with $\alpha = 0{,}6$.

Table 7. Forecasting Results with $\alpha = 0{,}6$

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0
February	11.216	11.173,6	42,4	42,4
March	11.199	11.188,84	10,16	10,16
April	11.244	11.221,94	22,064	22,064
May	11.153	11.180,57	-27,5744	27,5744
June	11.130	11.150,23	-20,2298	20,2298
July	11.238	11.202,89	35,1081	35,1081
August	11.451	11.351,76	99,24324	99,24324
September	12.568	12.081,5	486,4973	486,4973
October	12.791	12.507,2	283,7989	283,7989
November	12.722	12.636,08	85,91957	85,91957
December	12.788	12.727,23	60,76783	60,76783

Based on Table 7, it appears that with $\alpha = 0{,}6$ with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 12.727,23. Next is to calculate the MAE value for $\alpha = 0{,}6$ is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{1.078{,}16}{12} = 89{,}85.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0{,}6 \times 12.788 + (1 - 0{,}6)12.727{,}23 = \text{Rp } 12.763{,}69.$$

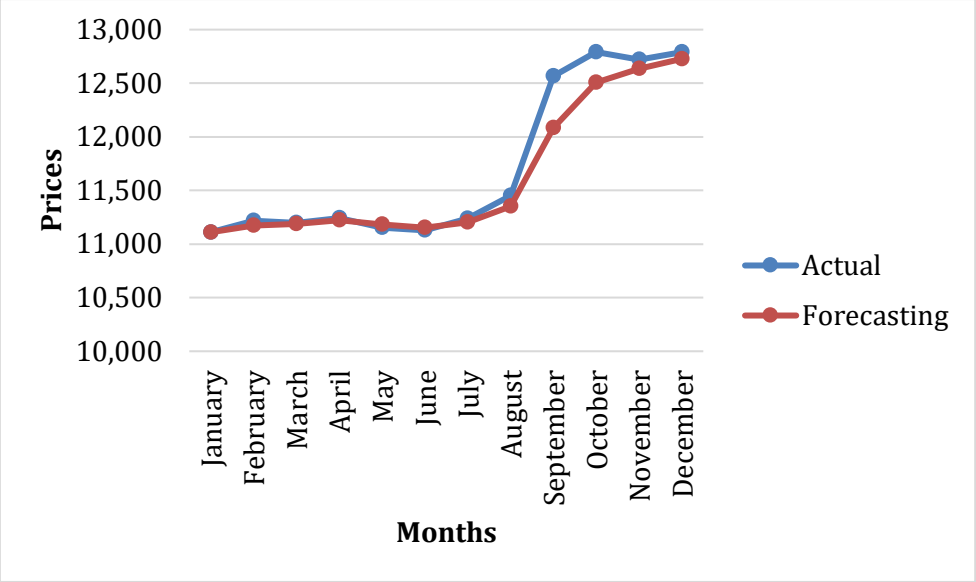

Figure 7. Graph of Forecast Data with α = 0,6

Single Exponential Smoothing with $\alpha = 0,7$

The following are the results of Single Exponential Smoothing forecasting with α = 0,7.

Table 8. Forecasting Results with α = 0,7

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0
February	11.216	11.184,2	31,8	31,8
March	11.199	11.194,56	4,44	4,44
April	11.244	11.229,17	14,832	14,832
May	11.153	11.175,85	-22,8504	22,8504
June	11.130	11.143,76	-13,7551	13,7551
July	11.238	11.209,73	28,27346	28,27346
August	11.451	11.378,62	72,38204	72,38204
September	12.568	12.211,19	356,8146	356,8146
October	12.791	12.617,06	173,9444	173,9444
November	12.722	12.690,52	31,48332	31,48332
December	12.788	12.758,76	29,24499	29,24499

Based on Table 8, it appears that with α = 0,7 with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 12.758,76. Next is to calculate the MAE value for α = 0,7 is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{706{,}61}{12} = 58{,}88.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0{,}7 \times 12.788 + (1 - 0{,}7)12.758{,}76 = \text{Rp}12.779{,}23.$$

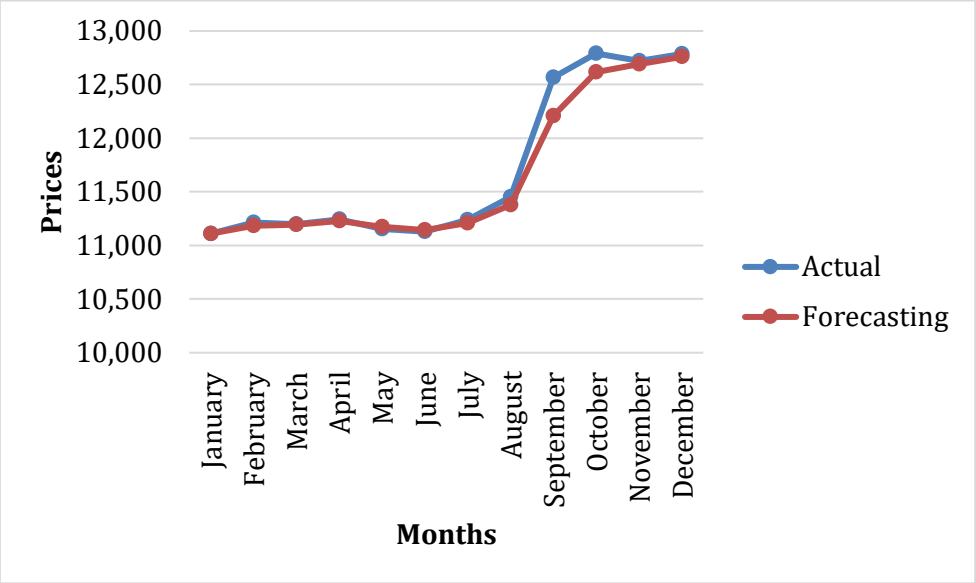

Figure 8. Graph of Forecast Data with α = 0,7

Single Exponential Smoothing with $\alpha = 0,8$

The following are the results of Single Exponential Smoothing forecasting with α = 0,8.

Table 9. Forecasting Results with α = 0,8

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0
February	11.216	11.194,8	21,2	21,2
March	11.199	11.198,16	0,84	0,84
April	11.244	11.234,83	9,168	9,168
May	11.153	11.169,37	-16,3664	16,3664
June	11.130	11.137,87	-7,87328	7,87328
July	11.238	11.217,97	20,02534	20,02534
August	11.451	11.404,39	46,60507	46,60507
September	12.568	12.335,28	232,721	232,721

October	12.791	12.699,86	91,1442	91,1442
November	12.722	12.717,57	4,428841	4,428841
December	12.788	12.773,91	14,08577	14,08577

Based on Table 9, it appears that with α = 0,8 with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 12.773,91. Next is to calculate the MAE value for α = 0,8 is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{415{,}98}{12} = 34{,}67.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0{,}8 \times 12.788 + (1 - 0{,}8)12.773{,}91 = \text{Rp } 12.785{,}18.$$

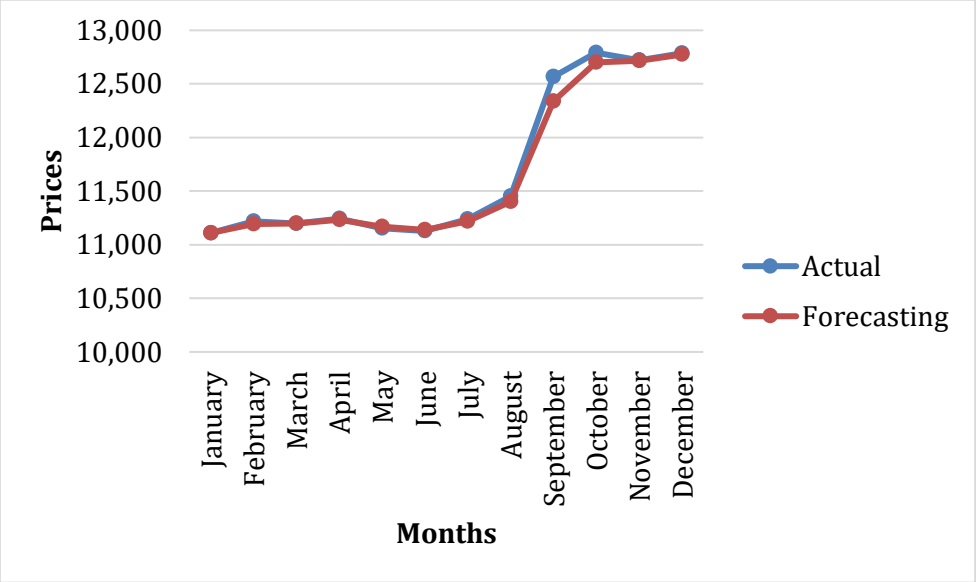

Figure 9. Graph of Forecast Data with α = 0,8

Single Exponential Smoothing with $\alpha = 0,9$

The following are the results of Single Exponential Smoothing forecasting with α = 0,9.

Table10. Forecasting Results with α = 0,9

	Xt	St	Xt-St	|Xt-St|
January	11.110	11.110	0	0
February	11.216	11.205,4	10,6	10,6
March	11.199	11.199,64	-0,64	0,64
April	11.244	11.239,56	4,436	4,436
May	11.153	11.161,66	-8,6564	8,6564

June	11.130	11.133,17	-3,16564	3,16564
July	11.238	11.227,52	10,48344	10,48344
August	11.451	11.428,65	22,34834	22,34834
September	12.568	12.454,07	113,9348	113,9348
October	12.791	12.757,31	33,69348	33,69348
November	12.722	12.725,53	-3,53065	3,53065
December	12.788	12.781,75	6,246935	6,246935

Based on Table 10, it appears that with $\alpha = 0{,}9$ with an actual value of Rp 11.110 to Rp 12.788, we get an estimate for the forecast, which is Rp 11.110 to Rp 12.781,75. Next is to calculate the MAE value for $\alpha = 0{,}9$ is

$$MAE = \frac{\Sigma|X_t - S_t|}{n} = \frac{185{,}75}{12} = 15{,}48.$$

So, the forecast for January 2024 (S_{13}) is

$$S_{13} = 0{,}9 \times 12.788 + (1 - 0{,}9)12.781{,}75 = \text{Rp } 12.787{,}38.$$

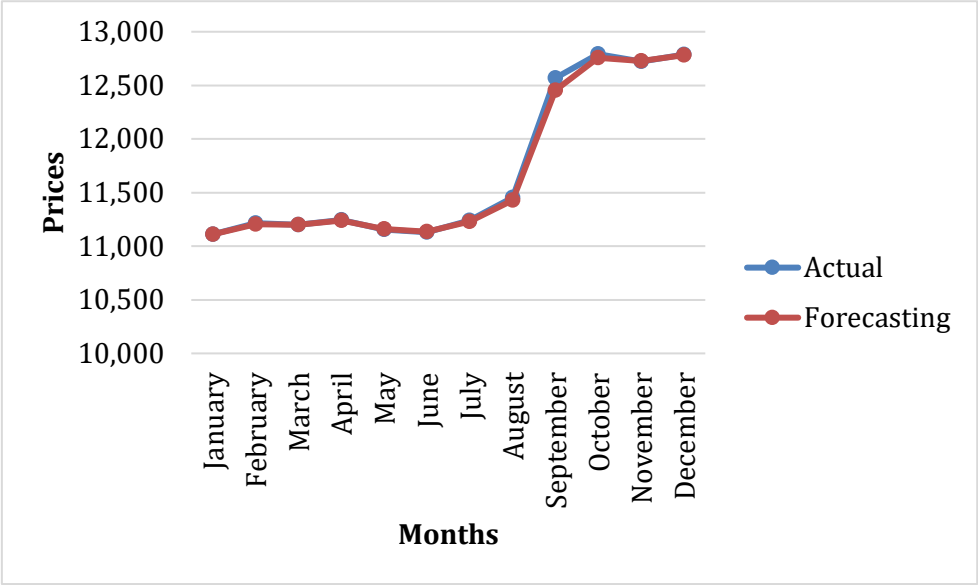

Figure 10. Graph of Forecast Data with $\alpha = 0{,}9$

The results of the Single Exponential Smoothing (SES) method using smoothing constants ranging from α = 0.1 to α = 0.9 indicate that the best forecasting performance was achieved at α = 0.9. This result is supported by the smallest Mean Absolute Error (MAE) value, namely 15.48, and by the forecasting graph, which shows that the predicted values closely follow the actual price movements of medium-grade rice in Lampung Province throughout 2023. These findings indicate that SES with a high smoothing constant is more responsive to recent price changes and is therefore more suitable for forecasting rice prices that experience sudden fluctuations.

Based on Table 10 and Figure 10, the actual rice prices increased significantly from August to September 2023, rising from Rp 11,451 to Rp 12,568. The forecasting results generated by SES with α = 0.9 were able to follow this upward trend effectively, producing forecast values ranging from Rp 11,110 to Rp 12,781.75. The close similarity between actual and forecasted values demonstrates that the SES model can capture short-term price dynamics effectively. This condition occurs because a larger α value gives greater weight to the most recent observations, causing the forecasting results to adjust more quickly to current market conditions.

The main finding of this study is that SES with α = 0.9 provides the most accurate forecasting model for medium-grade rice prices in Lampung Province during the observation period. This finding suggests that rice prices in 2023 were strongly influenced by recent market conditions rather than long-term historical patterns. Therefore, the forecasting model requires a high level of responsiveness to recent data changes.

Several factors may explain why α = 0.9 produced the best results. First, rice prices in 2023 experienced relatively rapid fluctuations due to changes in supply and demand conditions. Second, government policies such as the highest retail price policy may have influenced market price adjustments. Third, external factors such as weather conditions, distribution costs, inflation, and harvest productivity also contributed to price instability. Since SES with a high α value emphasizes recent observations, the model was better able to adapt to these rapidly changing conditions.

This study has several advantages. The SES method is simple, easy to implement, and computationally efficient, making it suitable for short-term forecasting (Panggabean et al., 2021). In addition, the method can provide quick information for policymakers regarding possible future price movements. However, this study also has limitations. SES is less effective for data containing strong trends or seasonal patterns because it only considers the current level of data without explicitly modeling trend and seasonality components. Furthermore, the study only used one forecasting method and limited data from one year of observation.

The results of this study are consistent with previous studies that found SES to be effective for short-term forecasting with relatively stable or moderately fluctuating data. For example, previous research by (Rosita & Moonlight, 2024; Sumitra & Sidqi, 2024) reported that SES performs well in forecasting commodity prices because the method can quickly adapt to recent price movements. However, this study also suggests that for data with stronger trends or seasonal characteristics, more advanced methods such as Double Exponential Smoothing (DES) or ARIMA may provide better forecasting accuracy.

The implications of this research are important for both policymakers and market stakeholders. Accurate forecasting of rice prices can help the government evaluate the effectiveness of the HET policy and support decision-making related to food price stabilization. In addition, forecasting results can provide early warning information

regarding potential price increases, allowing authorities to prepare appropriate interventions to maintain market stability and protect consumer purchasing power. Thus, this study contributes to the development of forecasting models for food commodity price monitoring in Lampung Province.

CONCLUSIONS AND SUGGESTIONS

The forecast of the realization of the Medium Grade Rice Retail Price in Lampung province for the period January to December 2023 using Single Exponential Smoothing method with the smallest error value of 15,48 on the parameter $\alpha = 0{,}9$ resulted in a prediction of Rp.12.787,38 which was rounded to Rp.12.787,00. Compared with actual data from the Dinas Ketahanan Pangan, Tanaman Pangan, dan Hortikultura in January 2024 which shows the price of Rp.13.503, the forecast results with this method can be close to the actual value.

For future studies, it is possible to extend the analyzed time period, for example by processing data over the past few years get more robust forecasting patterns. Evaluations over different time periods can provide a deeper understanding of the effectiveness of the Single Exponential Smoothing method against changing market conditions.

Author Contributions

First author: conceptualization, methodology, writing-original draft, software, validation. Second author: data curation, resources, draft preparation. Third author: Formal analysis, validation. Fourth author: validation, writing-review, and editing. All authors discussed the results and contributed to the final manuscript.

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Declarations

The authors declare there is no conflicts of interest to report study.

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