

ASSESSING FARMERS' WELFARE IN BENGKULU PROVINCE THROUGH FARMERS' TERM OF TRADE AND ZAKAT-BASED SOCIAL GROUP CLASSIFICATION

NONIE AFRIANTY¹, ANDANG SUNARTO^{1,*}, JACKEL VUI LUNG CHEW^{2,*}, NURLIA LATIFAH¹

¹Universitas Islam Negeri (UIN) Fatmawati Sukarno, 38211, Bengkulu, Indonesia

²Faculty of Computing and Informatics, Universiti Malaysia Sabah Labuan International Campus, 87000, Labuan, Malaysia

*Corresponding authors: andangs@mail.uinfasbengkulu.ac.id, jackelchew93@ums.edu.my

Received Jul. 20, 2025

ABSTRACT. This study aims to assess the welfare of farmers in Bengkulu Province by employing farmers' term of trade and zakat-based social group classifications. A mixed-method approach is adopted, combining quantitative analysis using the ARIMA Box-Jenkins forecasting model on farmers' term of trade time series data from January 2021 to December 2023, and qualitative analysis based on zakat classification categories such as the wealthy (muzakki), the middle-income group, and the underprivileged (mustahik). The quantitative results show that the ARIMA (1,0,0) model is the most suitable for forecasting farmers' term of trade, with projected values for year 2024 ranging from 138.57 to 142.68. These projections suggest that farmers' purchasing power remains stable and falls within the surplus category. However, the qualitative results reveal that most farmers in Bengkulu Province are still classified as mustahik, signifying persistent welfare disparities and dependence on zakat. These findings highlight the critical need to strengthen the role of productive zakat and foster cross-sector collaboration as tools for empowering the agricultural economy. This study recommends that agricultural development policies should incorporate not only economic indicators but also socio-religious dimensions to achieve sustainable improvements in farmers' welfare.

2020 Mathematics Subject Classification. 62M10; 91B82.

farmers' term of trade; Zakat-based welfare classification; ARIMA; rural economic empowerment; agricultural development policy

1. INTRODUCTION

Indonesia's development policy is aimed at improving community welfare by considering social and economic characteristics as key foundations of overall national development [1]. The agricultural sector plays a strategic and prioritized role in this effort, as 43.6% of Indonesia's population resides in rural areas, where the majority depend on agriculture for their livelihoods [2]. The agricultural industry

contributes significantly to food security, nutrition, and overall welfare, encompassing sub-sectors such as food crops, horticulture, livestock, fisheries, and plantations [3,4].

The utilization of local resources is critical to ensuring the sustainability and crisis resilience of the agricultural sector [5]. According to Simatupang and Timmer [6], Indonesia's rice production remained resilient during the economic crisis due to government policies that strengthened local infrastructure and agricultural extension systems. These findings highlight the importance of public policies that optimize local potential as a foundation for sustainable agricultural development.

In Bengkulu Province, 67% of the population lives in rural areas and relies heavily on agriculture [2]. According to the gross regional domestic product data for 2022, Bengkulu's economy grew by 6.58%, with the agricultural sector contributing 20% to this growth [7]. These figures reinforce the significance of agriculture as a primary source of livelihood in the region. Enhancing agricultural value-added requires industrial transformation through infrastructure development, price stabilization, and farmer protection policies.

The impact of agricultural transformation on farmers' livelihoods can be evaluated using measurable indicators of welfare. In Indonesia, the farmers' term of trade (ToT) is commonly used to assess farmers' welfare [8]. ToT is calculated as the ratio of the price index received by farmers to the price index paid by farmers. If the value of ToT is greater than 100, it indicates a surplus (income exceeds expenses); while if the value is below 100, it indicates a deficit [9]. Thus, ToT reflects the balance between farmers' income from agricultural production and the cost of household consumption and production inputs [10].

Several macroeconomic and policy factors influence ToT. High inflation rates can erode farmers' purchasing power [11]. Currency fluctuations also affect ToT. For instance, depreciation raises import prices and increases input costs, while appreciation lowers these burdens [11–13]. Government interventions, such as subsidies for fertilizers, fuel, and general agricultural expenditures, can enhance ToT by reducing production costs and boosting yields [12].

To forecast ToT values, the autoregressive integrated moving average (ARIMA) model is a suitable tool. The ARIMA model is widely recognized for its effectiveness in time series forecasting, particularly when the data exhibit nonstationarity, which is common in economic and agricultural datasets [14,15]. Additionally, ARIMA is effective for analyzing time series data with unclear patterns [16]. This model also incorporates the time dimension explicitly, analyzing data collected periodically and uncovering systematic historical trends [17].

However, conventional economic approaches that rely solely on income and consumption have limitations in assessing welfare, particularly in the informal sector. From an Islamic perspective, welfare encompasses not only material aspects such as income and consumption but also spiritual and social dimensions. Measuring welfare based solely on income is problematic due to the dominance of informal work, which is often unrecorded. Similarly, using consumption as an indicator is challenged by varying

consumption patterns among individuals. Islamic economics therefore introduces a distinct framework, classifying welfare based on zakat status into three categories, which are the wealthy (muzakki), the middle-income group, and the underprivileged (mustahik), the class that is eligible to receive zakat or anyone who falls under one or more of the eight categories of zakat recipients (ashnaf tsamaniyah) [18].

This study aims to develop an optimal ARIMA model to forecast the ToT in Bengkulu Province, Indonesia for the period January 2021 to December 2023. In addition, this study measures farmers' welfare by integrating the ToT model with Islamic socio-economic classification based on zakat status across all districts and cities in Bengkulu Province. The findings of this study are expected to inform the formulation of inclusive and sustainable agricultural development policies that embody social, economic, and spiritual justice in line with the principles of Islamic economics.

2. METHODOLOGY

This study adopts a mixed-methods research approach, combining both quantitative and qualitative methods to analyze the welfare of farmers in Bengkulu Province. The quantitative component involves analyzing time series data of ToT using the ARIMA Box-Jenkins forecasting method, while the qualitative component explores farmers' welfare through zakat-based social group classification. This mixed approach was chosen because a purely quantitative method would overlook socio-religious dynamics, while a purely qualitative method would lack measurable economic validation. By integrating both, this study provides a more comprehensive and contextualized analysis [19]. The data sources for this study are:

- Monthly ToT time series data for Bengkulu Province from January 2021 to December 2023, obtained from the BPS-Statistics Indonesia, and
- Zakat distribution data collected from the Bengkulu Provincial Amil Zakat Agency, Bengkulu City Amil Zakat Agency, Dompot Dhuafa Bengkulu, Indonesia Zakat Initiative Bengkulu, and DT Peduli Bengkulu.

For the quantitative analysis, this study employs the ARIMA Box-Jenkins model to forecast ToT values. The analysis consists of the following stages [16,20,21]:

a) Stationarity Testing

Data stationarity is assessed using time series plots and the Augmented Dickey-Fuller (ADF) test. If the data are non-stationary, appropriate differencing (∇d or ∇Ds) is applied to achieve stationarity.

b) Model Identification

Preliminary identification of ARIMA parameters is conducted through Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF) plots to determine the orders of the

ARIMA parameters such as non-seasonal components: (p, d, q) and seasonal components: (P, D, Q, s) .

c) Model Selection

The best model is selected based on the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC). The model with the lowest AIC and SIC values is considered optimal.

d) Model Verification

Residual diagnostics are performed to verify model adequacy. This includes tests for autocorrelation and normality.

e) Forecasting

The optimal ARIMA model is applied to forecast the ToT for the period January to December 2024 using Minitab 16 software. Minitab 16 was selected for its user-friendly interface and reliable time series forecasting tools, making it suitable for applied research in the social sciences.

For the qualitative analysis, this study assesses farmers' welfare based on their zakat status, utilizing the Islamic social classification of the wealthy (muzakki), the middle-income group, and the underprivileged (mustahik). This classification framework provides a socio-religious lens to complement the economic indicators, aligning with Islamic economic principles.

3. RESULTS AND DISCUSSION

3.1. Data Description. This study utilizes monthly time series data on ToT in Bengkulu Province from January 2021 to December 2023. This dataset captures three years of fluctuations, seasonal variations, and trends in farmers' welfare.

TABLE 1. Farmers' Term of Trade in Bengkulu Province.

Month	2021	2022	2023
January	124.91	143.00	139.58
February	124.71	145.48	141.38
March	128.78	147.32	144.32
April	129.42	146.88	142.21
May	130.63	127.02	138.80
June	127.81	120.66	142.14
July	128.51	110.43	143.73
August	132.15	122.90	147.15
September	136.04	130.15	152.65
October	140.04	135.24	154.28
November	143.80	140.75	157.42
December	143.93	139.85	158.41

Based on Table 1, the highest ToT was recorded in December 2023 at 158.41, while the lowest occurred in July 2022 at 110.43, with an overall average of 137.95. These figures formed the basis for time series modeling to forecast the 2024 ToT values.

3.2. Farmers' Term of Trade Data Analysis in Bengkulu Province.

3.2.1. *Stationarity Test.* As the ARIMA model requires a stationary series, an initial visual inspection was conducted using a time series plot (see Figure 1). The plot suggested stable fluctuations around a constant mean, indicating stationarity.

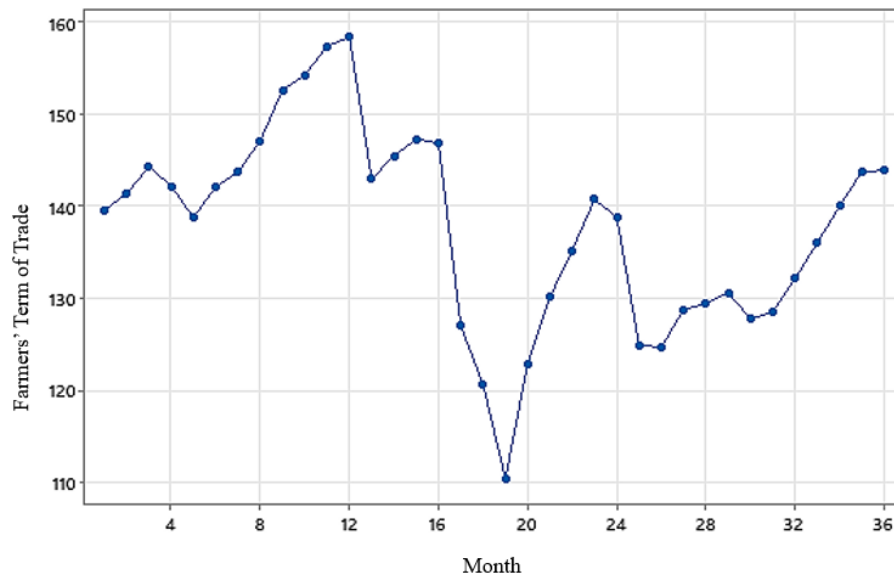


FIGURE 1. Farmers' Term of Trade Time Series Plot.

To confirm this, the ADF test was conducted (see Table 2), yielding a test statistic of -4.63 and a p -value of 0.000, which is below the 0.05 significance threshold. Hence, the null hypothesis was rejected, confirming that the data are stationary at level ($d = 0$) and do not require differencing.

TABLE 2. Augmented Dickey-Fuller Test Results.

Test Statistic	p -Value	Decision
-4.63384	0.000	Stationary ($d = 0$)

3.2.2. Model Identification and Selection.

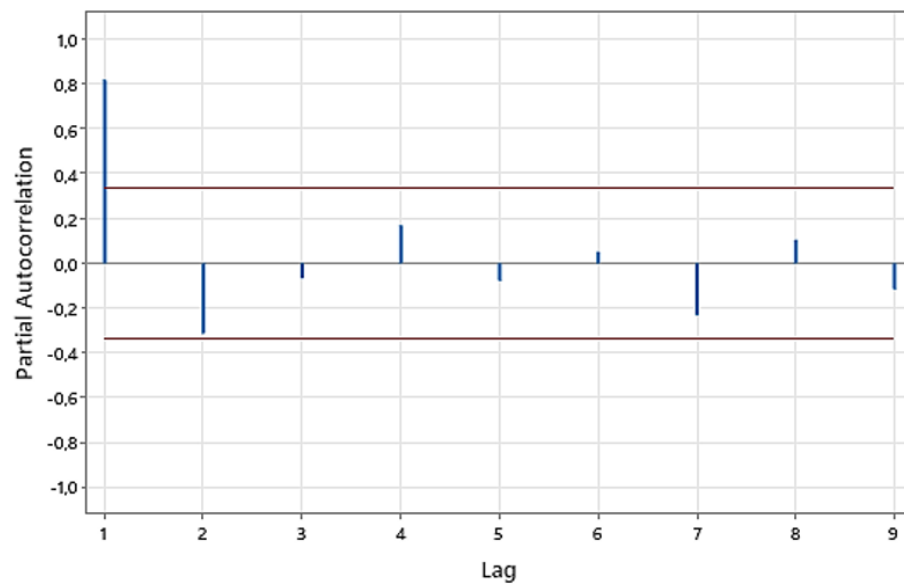


FIGURE 2. Autocorrelation Function Plot of Farmers' Term of Trade.

The ACF plot (Figure 2) displays a gradual tapering off or tailing pattern rather than a sharp cutoff. This is also characteristic of an autoregressive process, where the autocorrelations decline gradually over time, as opposed to a moving average process which would exhibit a sharp cutoff in the ACF.

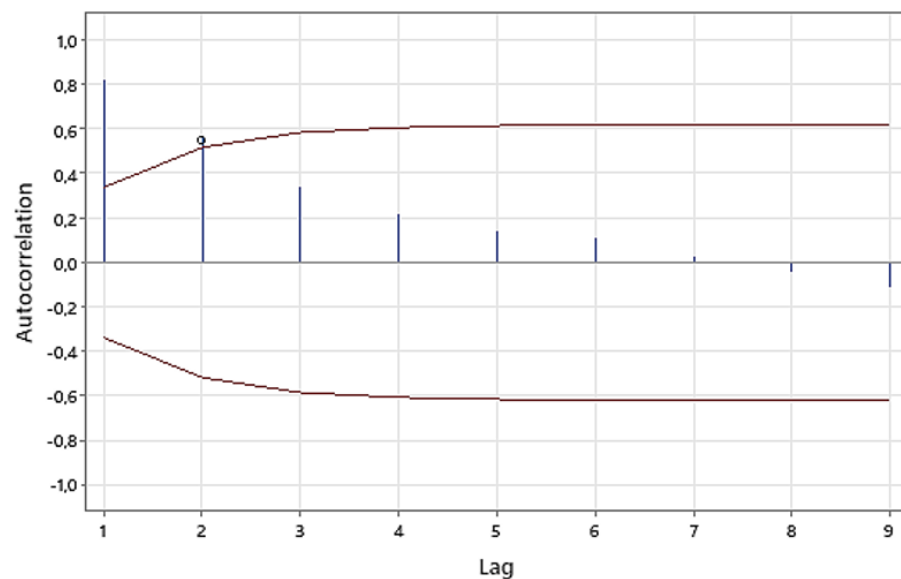


FIGURE 3. Partial Autocorrelation Function Plot of Farmers' Term of Trade.

In contrast, the PACF plot (Figure 3) exhibits a significant spike at lag 1, followed by a rapid drop, with all subsequent lags falling within the significance bounds. This pattern suggests the presence of a

first-order autoregressive component, or AR(1). In AR processes, the PACF typically cuts off after the lag order, which is consistent with the observed structure.

Taken together, the ACF and PACF plots indicate that the data are best represented by an ARIMA(1,0,0) model, where $p = 1$ (based on the PACF cutoff), $d = 0$ (confirmed by the stationarity test), and $q = 0$ (based on the ACF tailing pattern). This model was further validated using the “Best ARIMA Model” selection tool in Minitab 16. Among the candidate models, ARIMA(1,0,0) yielded the lowest Mean Square Error (MSE = 38.54), outperforming alternatives such as ARIMA(0,0,1) with an MSE of 59.70. Additionally, the AIC and SIC values also favored ARIMA(1,0,0).

Following model selection, the ARIMA(1,0,0) model was estimated, and its parameters were evaluated for statistical significance. The estimation results are presented in Table 3.

TABLE 3. Parameter Estimates.

Parameter	P-Value
AR(1) coefficient = 0.8277	0.000
Constant = 23.88	0.000

Both the autoregressive coefficient (AR(1)) and the constant term are statistically significant at the 1% level, as indicated by p-values less than 0.01. This suggests that the model reliably captures the underlying temporal dynamics of the ToT time series. The mathematical form of the estimated ARIMA(1,0,0) model is given by

$$Z_t = a_t + 0.8277a_{t-1} + 23.88, \quad (1)$$

where Z_t is the value of the ToT at time t , a_t is the white noise error term at time t , and a_{t-1} is the previous time period's white noise.

Equation (1) confirms that the ARIMA(1,0,0) model not only fits the historical data well but also satisfies the criteria for a stable forecasting model. The next step involves diagnostic checking to ensure that the residuals of the fitted model behave like white noise and meet the assumptions of normality and independence.

3.2.3. Model Verification. The Ljung-Box Q-test assesses whether any group of autocorrelations of the residuals is significantly different from zero. The test was performed in lags 12 and 24, and the results are presented in Table 4.

TABLE 4. Ljung-Box Q-Test Results.

Lag	P-Value
12	0.088
24	0.306

Based on Table 4, both p-values exceed the 0.05 significance level, indicating that there is no significant autocorrelation remaining in the residuals. Therefore, the model passes the white noise test, suggesting that the residuals are uncorrelated over time.

To verify the assumption of normality, a normality test was applied to the residuals. The test produced a p-value of 0.109, which is greater than the 0.05 threshold, indicating that the residuals are approximately normally distributed.

These results of the residual diagnostics confirm that there is no autocorrelation in the residuals (based on the Ljung-Box test), and the residuals follow a normal distribution (based on the residual normality test). As such, the ARIMA(1,0,0) model meets the required statistical assumptions and is considered a valid and reliable model for forecasting ToT in Bengkulu Province.

3.2.4. Forecasting Farmers' Term of Trade in Bengkulu Province. Having validated the ARIMA (1,0,0) model through statistical diagnostics, the model was applied to forecast ToT in Bengkulu Province for the period January to December 2024. The objective of this forecast is to estimate the near-future purchasing power of farmers and assess their projected welfare conditions.

The forecast was conducted using Minitab 16 software, which provides point forecasts along with 95% confidence intervals. The resulting projections (see Table 5) show a relatively stable trend throughout 2024, with ToT values fluctuating between 138.579 and 142.683, indicating that the farmers' purchasing power is expected to remain above the equilibrium threshold of 100.

TABLE 5. Forecasted Farmers' Term of Trade in Bengkulu Province (2024).

Month in 2024	Forecast	Lower	Upper
January	142.683	130.780	154.587
February	141.625	124.644	158.607
March	140.828	121.548	160.107
April	140.227	119.757	160.697
May	139.774	118.657	160.890
June	139.432	117.957	160.907
July	139.175	117.499	160.851
August	138.981	117.192	160.770
September	138.835	116.982	160.688
October	138.725	116.835	160.614
November	138.642	116.732	160.552
December	138.579	116.657	160.501

Projections showed by Table 5 reflect a mild downward adjustment in ToT values across the months but consistently remain above the benchmark level of 100, which indicates a surplus condition (farmers'

income is higher than their expenditures). This is an important finding, as it demonstrates a level of economic resilience and stability among farmers in Bengkulu Province for the projected year.

The forecast outcomes are consistent with findings by Pratiwi et al. [16], who argue that the ToT is an effective indicator for tracking purchasing power and guiding agricultural policy development. The use of ARIMA modeling, particularly with a validated structure such as ARIMA(1,0,0), provides policymakers and stakeholders with a reliable tool for anticipating future conditions and formulating evidence-based interventions.

3.2.5. Qualitative Discussion on Zakat-Based Welfare Classification. Welfare assessment from an Islamic economic perspective considers not only income and consumption but also spiritual and socio-religious dimensions. One widely adopted approach is the zakat-based classification of social groups, which categorizes individuals into three primary groups: the wealthy (muzakki), the middle-income group, and the underprivileged (mustahik), who fall under the eight categories of zakat recipients (ashnaf tsamaniyah). This classification more accurately reflects an individual's socioeconomic position and societal role, particularly within the framework of distributive justice [22,23].

The findings of this study reveal that most farmers in Bengkulu Province are classified as mustahik, indicating that their welfare level remains relatively low when viewed through the lens of Islamic social status. These farmers are not yet able to fulfil the role of muzakki (zakat contributors) and continue to require socio-economic assistance to elevate their standard of living. This is consistent with the findings of Hapsari et al. [1], who noted that while productive zakat programs can improve welfare outcomes, most beneficiaries remain in the mustahik category due to persistent structural challenges.

Nevertheless, positive developments were observed in several areas, such as Mukomuko Regency, where some farmers previously classified as mustahik have transitioned to muzakki status. This upward mobility illustrates that socio-economic transformation is achievable through planned and sustained implementation of productive zakat programs [24]. Similar success was documented by Beik et al. [25], whose study on a zakat-based livestock initiative in Tanah Datar demonstrated that targeted, income-generating interventions could enhance mustahik asset ownership and economic resilience.

Despite these success stories, the study also highlights notable institutional limitations, particularly in the areas of documentation and longitudinal monitoring. Many provincial and district-level BAZNAS offices lack systematic mechanisms to track the socio-economic progression of mustahik, including their employment history and transitions in social classification. This shortfall undermines efforts to accurately evaluate the long-term effectiveness of zakat programs on beneficiary mobility [26].

In summary, the welfare level of farmers in Bengkulu Province remains predominantly within the mustahik group, stressing the need to strengthen empowerment strategies rooted in productive zakat. However, opportunities for welfare improvement exist, especially if zakat institutions enhance their mentorship programs, business coaching initiatives, and structured data recording systems. Moving

forward, integrating zakat-based social classification with quantitative economic indicators, such as the ToT, will offer a more comprehensive and multidimensional approach to assessing farmers' welfare.

4. CONCLUSION AND RECOMMENDATIONS

This study integrates two approaches to measure the welfare of farmers in Bengkulu Province, which are the farmers' ToT and zakat-based social group classification. Based on this study results, the following conclusions can be drawn:

- The optimal time series model for forecasting ToT of Bengkulu Province from 2021 to 2023, using the ARIMA method and Minitab 16 software, is ARIMA(1,0,0). The resulting model is $Z_t = a_t + 0.8277a_{t-1} + 23.88$.
- The forecasted ToT values for the period January to December 2024 indicate stable purchasing power, with all predicted values remaining above 100. This suggests that, on average, farmers' incomes exceed their expenditures, placing them in a surplus condition.
- The welfare assessment based on zakat-based social classification shows that most farmers in Bengkulu Province are still categorized as mustahik. This highlights that, despite economic indicators suggesting stability, a large proportion of farmers remain socially and spiritually dependent on zakat support.

Considering these findings, the following recommendations are proposed:

- Local government bodies and relevant institutions, particularly the Agriculture Department, BAZNAS, and LAZ in Bengkulu Province, should enhance policy integration between agricultural productivity programs and zakat-based empowerment strategies.
- Strengthening farmers' welfare should focus on productivity enhancement, price stabilization, and social empowerment through structured mustahik development programs.
- The successful application of the ARIMA(1,0,0) model as a predictive tool for ToT should serve as a reference in adaptive agricultural planning, helping stakeholders better respond to fluctuations in farmers' economic conditions.
- It is crucial for zakat institutions to establish a comprehensive data collection and tracking system to monitor the socio-economic status of mustahik over time. This would enable more accurate evaluations of program effectiveness and facilitate the transformation of beneficiaries from zakat recipients to zakat contributors (muzakki).

Acknowledgements. The authors wish to acknowledge the financial support provided by Universiti Malaysia Sabah for the publication of this study.

Authors' Contributions. All authors have read and approved the final version of the manuscript. The authors contributed equally to this work.

Conflicts of Interest. The authors declare that there are no conflicts of interest regarding the publication of this paper.

REFERENCES

- [1] H. Hapsari, E. Wulandari, E. Suminartika, T. Karyani, The Family Welfare of Horticulture Farmers: Case in Pegalengan District, Bandung Regency, West Java, IOP Conf. Ser.: Earth Environ. Sci. 653 (2021), 012092. <https://doi.org/10.1088/1755-1315/653/1/012092>.
- [2] BPS-Statistics Indonesia, Jumlah Penduduk Menurut Wilayah, Daerah Perkotaan/Perdesaan Indonesia Tahun 2022. 2022. <https://sensus.bps.go.id/topik/tabular/sp2022/187/1/1200>.
- [3] FAO, The Future of Food and Agriculture: Trends and Challenges, Food and Agriculture Organization of the United Nations, 2017. <https://digitallibrary.un.org/record/1311693>.
- [4] S. Khadarisna, Agustono, A. Qonita. Identifikasi Kinerja Subsektor Tanaman Pangan, Hortikultura, Perkebunan, Perternakan dan Jasa Pertanian dalam Pembangunan Perekonomian di Kabupaten Tulungagung, Agrista 10 (2022), 97–111.
- [5] M. Sari, M. Uwi'ah. Optimalisasi Sumber Daya Lokal dalam Sistem Pertanian Berkelanjutan untuk Pengentasan Kemiskinan di Pedesaan, J. Kolaboratif Sains, 8 (2025), 264–270.
- [6] P. Simatupang, C. Peter Timmer, Indonesian Rice Production: Policies and Realities, Bull. Indones. Econ. Stud. 44 (2008), 65–80. <https://doi.org/10.1080/00074910802001587>.
- [7] BPS-Statistics Indonesia, Gross Regional Domestic Product of Provinces in Indonesia by Expenditure 2019–2023, BPS-Statistics Indonesia, Jakarta, 2024.
- [8] A.N. Tenriawaru, M. Arsyad, A. Amuriddin, N.M. Viantika, N.H. Meilani, Analisis dan Deteminan Nilai Tukar Petani Tanaman Pangan (NTPP) di Provinsi Sulawesi Selatan, J. Agric. Ext. 45 (2021), 146–151.
- [9] Larasati Puspita Saridewi, A.K. Hidayati, Analisis Nilai Tukar Petani Komoditas Kedelai Di Yogyakarta, J. Agribus. Sci. Rural. Dev. 2 (2023), 15–24. <https://doi.org/10.32639/jasrd.v2i2.363>.
- [10] T.N. Arhan, R. Darma, A.R. Munir, Analyzing Factors Influencing Farmer Term of Trade for Food Crops: a Case Study of South Sulawesi, Indonesia, Univers. J. Agric. Res. 12 (2024), 418–428. <https://doi.org/10.13189/ujar.2024.120220>.
- [11] R. Ramadhanu, R. Ginting, S.F. Ayu, Analysis of Factors Affecting Farmer Exchange Rate in North Sumatera Province, IOP Conf. Ser.: Earth Environ. Sci. 782 (2021), 022050. <https://doi.org/10.1088/1755-1315/782/2/022050>.
- [12] A. Arintoko, H. Sambodo, R. Priyono, Do International Oil Prices, Exchange Rates and Agricultural Credit Matter for Farmers' Term of Trade in Indonesia? Empirical Evidence of Multiple Thresholds and Asymmetric Effects, Res. World Agric. Econ. (2024), 71–87. <https://doi.org/10.36956/rwae.v6i1.1305>.
- [13] J. Sulaksana, Analysis of Factors Affecting the Farmer's Term of Trade of Fruit Farmers, IOP Conf. Ser.: Earth Environ. Sci. 466 (2020), 012017. <https://doi.org/10.1088/1755-1315/466/1/012017>.
- [14] B. Dinga, J.H. Claver, C.K. Kum, S.F. Che, Predicting Exchange Rates Volatility Using Hybrid ARIMA-GARCH Model: A Comparative Analysis, in: Data Analytics and AI for Quantitative Risk Assessment and Financial Computation, IGI Global, 2024: pp. 107–130. <https://doi.org/10.4018/979-8-3693-6215-0.ch005>.
- [15] I.A. Botygin, V. Sherstnev, A. Sherstneva, Basic minimum stack of experiments in time series forecasting with ARIMA model, in: Third International Conference on Digital Technologies, Optics, and Materials Science (DTIEE 2024), SPIE, 2024, 132170L. <https://doi.org/10.1117/12.3035836>.
- [16] D. Pratiwi, S.M. Agustini, W. Windasari, E.N. Kencana, Forecasting Farmer Exchange Rate in Bali Province Using Seasonal Autoregressive Integrated Moving Average (SARIMA) Method, J. Phys.: Conf. Ser. 1503 (2020), 012002. <https://doi.org/10.1088/1742-6596/1503/1/012002>.

- [17] S. Makridarkis, W. Wright, C. Steven, *Metode dan Aplikasi Peramalan*, Erlangga, Jakarta, 1999.
- [18] A. Sodiq, *Konsep Kesejahteraan dalam Islam*, *Equilibrium*, 3 (2015), 380–405.
- [19] J.W. Creswell, J.D. Creswell, *Research Design: Qualitative, Quantitative and Mix Method Approach*, Sage Publication, 2008.
- [20] G.E. Box, G.M. Jenkins, G.C. Reinsel, G.M. Ljung, *Time Series Analysis: Forecasting and Control*, Wiley, 2015.
- [21] P.J. Brockwell, R.A. Davis. *Introduction to Time Series and Forecasting*, Springer, 2016.
- [22] A.W. Mongkito, S. Samdin, The Role of Zakat in Poverty Alleviation and Farmer Welfare; the Theoretical Review, *J. Glob. Innov. Agric. Sci.* (2025), 285–296. <https://doi.org/10.22194/jgias/25.1427>.
- [23] R.S. Rahmat, M.S. Nurzaman, Assesment of Zakat Distribution, *Int. J. Islam. Middle East. Financ. Manag.* 12 (2019), 743–766. <https://doi.org/10.1108/imefm-12-2018-0412>.
- [24] I. Mawardi, T. Widiastuti, M.U. Al Mustofa, F. Hakimi, Analyzing the Impact of Productive Zakat on the Welfare of Zakat Recipients, *J. Islam. Account. Bus. Res.* 14 (2023), 118–140. <https://doi.org/10.1108/jiabr-05-2021-0145>.
- [25] I.S. Beik, E.S. Bahri, B. Asmita, F. Fahrudin, Measurement of Zakat Impact Through Sustainable Livelihood Impact Assessment on Balai Ternak in Tanah Datar, *Test Eng. Manag.* 81 (2019), 2881–2892.
- [26] C. Boules, Y. Kato, Just Transition or Just Transitioning? Potentials and Limitations of Urban Growers’ Adaptations to the Impacts of the COVID-19 Pandemic, *Sustainability* 15 (2023), 9340. <https://doi.org/10.3390/su15129340>.