International Journal Of Health, Engineering And Technology (IJHET) E-ISSN 2829 - 8683
Volume 5, Number 3, September 2026, Page. 3362 - 3371
Email : editorijhess@gmail.com

Optimization Of Tofu Production Planning In Small And Medium Enterprises Using Linear Programming With The Simplex Method

Pangidoan Adventus Ambarita [1)*], Elida Madona Siburian[2)], Arianto H Hutasoit[3)], Roy Sahputra Saragih[4)]
[1,2,4)] Department of Secretarial, Politeknik Bisnis Indonesia, Indonesia
[3)] Department of Public Sector Financial Management, Akademi Minar Indonesia, Indonesia

*Corresponding Author
E-mail: pangidoanambarita52@gmail.com

Abstract

Mr. Rezeki Tofu SME in Pematangsiantar faces challenges in traditional production planning, which is not optimal for managing demand fluctuations and resource allocation. This study aims to formulate an optimal production plan to maximize daily profit by efficiently allocating resources using Linear Programming with the Simplex method. A descriptive qualitative research approach was employed, gathering primary data through direct observation and secondary data through interviews and documentation. Decision variables included the production quantities of White Tofu, Fried Tofu, and Yellow Tofu, constrained by raw materials (soybeans, vinegar, cooking oil, turmeric) and production time. The continuous optimization results revealed an optimal mix of 12.2947 barrels of White Tofu, 50 barrels of Fried Tofu, and 50 barrels of Yellow Tofu, achieving a maximum profit of IDR 5,745,893.72 per day. For operational implementation, rounding to 12 barrels of White Tofu, 50 barrels of Fried Tofu, and 50 barrels of Yellow Tofu yields a daily profit of IDR 5,740,000.00 (a minor decrease of 0.103%). Slack resource analysis identified soybeans, cooking oil, and turmeric as binding constraints, whereas vinegar and production time remained underutilized. In conclusion, the Simplex method effectively enhances resource allocation efficiency and profitability, indicating that production capacity expansion should prioritize securing scarce raw materials rather than extending working hours.

Keywords: Linear Programming; Maximum Profit; Production Optimization; Simplex Method; Tofu SME.

INTRODUCTION

Small and Medium Enterprises (SMEs) are fundamental pillars supporting the stability and growth of the national economy (Mile et al., 2009). Essentially, SMEs function not only as agile and adaptive business units but also play a crucial role as the largest source of employment, directly contributing to reducing unemployment and increasing community income (Ahammed, 2018). SMEs are dominant contributors to Gross Domestic Product (GDP), highlighting their significant role in achieving a country's fundamental macroeconomic objectives (Mohamed & Weber, 2019). Furthermore, this sector serves as an important innovative and competitive force, often being at the forefront of responding to market changes while promoting economic equality by expanding business activities across various regions.

At present, SMEs face increasingly intense market competition, both from other SME operators and from large-scale business entities (Clacier et al., 2023). This competitive intensity requires SMEs to continuously improve their operational efficiency and product innovation (Primafira et al., 2024). Furthermore, the challenges faced by SME entrepreneurs often include limited capital, limited access to technology, fluctuations in raw material prices, as well as difficulties in supply chain management and digital marketing (Agung & Lestari, 2025; Anggraeni, 2025; Khairani & Tantono, 2025). In the context of improving business competitiveness and sustainability, efforts to optimize available resources have therefore become crucial.

The production planning problem at Bapak Rezeki Tofu SME in Rambung Merah, Pematangsiantar, is the main focus of this study. The SME produces Fried Tofu, White Tofu, and Yellow Tofu and currently relies on conventional production planning based on historical data. This approach is unable to adequately address fluctuations in market demand, which often result in production imbalances and potential losses. Therefore, this study aims to apply a Linear Programming approach to formulate an optimal allocation of resources in order to maximize profitability and provide the business owner with a more analytical and accurate production planning solution (Ali et al., 2019).

To address the production planning constraints faced by Bapak Rezeki Tofu SME, Linear Programming provides a relevant mathematical framework (Wei, 2020). Linear Programming enables complex resource allocation problems to be transformed into a structured optimization model (Solaja et al., 2019). The model aims to determine the optimal combination of production quantities for Fried Tofu, White Tofu, and Yellow Tofu that maximizes total profit (Nakai, 2021). The Linear Programming model is formulated through an objective function to be maximized and a set of constraints that limit the utilization of key resources, such as soybeans, water, and working time (Ali et al., 2019). Subsequently, the model is systematically solved using the Simplex Method algorithm. The Simplex Method enables the determination of an optimal solution efficiently, providing specific and data-driven recommendations for daily production quantities (Rusdiana et al., 2024). Consequently, the proposed approach is expected to reduce production imbalances and directly improve the profitability of Bapak Rezeki's business.

RESEARCH METHODS

This study employs a descriptive research approach aimed at explaining and describing the process of solving a linear programming problem using the Simplex Method. The type of research used is descriptive qualitative research, which focuses on presenting and interpreting phenomena as they naturally occur (Waruwu, 2024), including the conditions and relationships that emerge between linear programming solution techniques and the characteristics of the problems encountered.

The data sources in this study were obtained from Bapak Rejeki's Tofu SME as the object of observation. The data used consisted of primary and secondary data. Primary data were obtained through direct observation of the production process to record the workflow, processing time, and use of raw materials. Secondary data were obtained through structured interviews with the business owner and examination of administrative documents, including sales data, cost of goods and selling prices, operational working hours, and raw material availability.

The analysis was conducted by formulating a Linear Programming (LP) model. An LP problem consists of several components (Baki & Cheng, 2020). The main components of the LP model are described as follows:

Decision Variables

Decision variables are physical quantities that are calculated and controlled by the decision-maker and represented by mathematical symbols. These variables are generally denoted by $\mathrm{x}_1, \mathrm{x}_2, \dots, \mathrm{x}_\mathrm{n}$, where n is a finite positive integer, namely $\mathrm{x}_1, \mathrm{x}_2, \dots, \mathrm{x}_\mathrm{n} \geq 0$.

Objective Function

The objective function of an LP problem is expressed in terms of the decision variables to optimize a specified optimality criterion. The objective function is given by

$$Z = c_1x_1 + c_2x_2 + \cdots + c_nx_n$$

Where is a linear function of n decision variables. The constant $\mathrm{c}_1, \mathrm{c}_2, \dots, \mathrm{c}_\mathrm{n}$ is a real number referred to as the objective function coefficient. The objective function can be formulated depending on whether the problem involves maximization or minimization.

Constraints

Constraints represent limitations related to the utilization of resources, including physical, financial, legal, technological, ethical, and other limitations that restrict the extent to which an objective can be achieved. For example, resources such as raw materials, labor, machinery, capital, workspace, and other resources may affect the resulting output. These constraints must be expressed as linear equations or inequalities involving the decision variables.

Non-Negativity Constraints

An important component of an LP problem concerns the interpretation and restriction of the decision variables. The non-negativity constraint in an LP model is expressed as an inequality of the form $\boldsymbol{x_i \geq 0}$, while the non-positive constraint is expressed in the form $\boldsymbol{x_i \leq 0}$.

The Linear Programming model was solved using the Simplex Method (Puspita et al., 2022; Susanti, 2021) . The Simplex Method is one of the techniques used to solve linear programming problems and obtain an optimal solution through a systematic iterative process. This method is capable of handling multiple decision variables and can be applied manually or with the assistance of software. The solution procedure includes determining the decision variables, formulating the objective function, constructing the constraints in mathematical form, and presenting the resulting model in a simplex tableau to determine the pivot elements as the basis for the iteration process until an optimal solution is obtained (Mon, 2019).

RESULTS AND DISCUSSION

Model Solution Using the Simplex Method

The Linear Programming model was solved using the Simplex Method to obtain a production combination that maximizes total profit. Before the iteration process was performed, each constraint was converted into an equation by adding slack variables $s_1, s_2, s_3, s_4,$ and s_5. These variables represent the remaining amounts of soybeans, vinegar, cooking oil, turmeric, and production time, respectively.

The standard form of the Linear Programming model is as follows:

$$13{,}80x_1 + 9{,}9667x_2 + 10{,}64x_3 + s_1 = 1.200$$
$$1{,}40x_1 + 1{,}50x_2 + 1{,}60x_3 + s_2 = 200$$
$$3x_2 + s_3 = 150$$
$$4x_3 + s_4 = 200$$
$$0{,}60x_1 + 1{,}3333x_2 + 1{,}80x_3 + s_5 = 420$$

The objective function in standard form is expressed as follows:

$$Z - 20.000x_1 - 50.000x_2 - 60.000x_3 = 0$$

The coefficients 9,9667 and 1,3333 are used in the calculations without full rounding. The four-decimal-place rounding shown in the table is applied only to facilitate the presentation of the results.

Initial Iteration

The initial simplex tableau is constructed by placing the slack variables $s_1, s_2, s_3, s_4, and\ s_5$ as the basic variables. The arrangement of the objective function and constraint coefficients in the initial iteration is presented in Table 1.

Table 1. Initial Simplex Table

Basic Variables	x_1	x_2	x_3	s_1	s_2	s_3	s_4	s_5	NK
s_1	13,8000	9,9667	10,6400	1	0	0	0	0	1.200
s_2	1,4000	1,5000	1,6000	0	1	0	0	0	200
s_3	0	3,0000	0	0	0	1	0	0	150
s_4	0	0	4,0000	0	0	0	1	0	200
s_5	0,6000	1,3333	1,8000	0	0	0	0	1	420
Z	−20.000	−50.000	−60.000	0	0	0	0	0	0

Based on Table 1, the most negative coefficient in the Z row is −60,000 and is located in the x_3 column. Therefore, x_3 is selected as the entering variable. The leaving variable is determined by calculating the ratio between the right-hand-side value and the positive coefficient in the x_3 column, as follows:

$$\frac{1.200}{10,64} = 112,7819$$
$$\frac{200}{1,60} = 125$$
$$\frac{200}{4} = 50$$
$$\frac{420}{1,80} = 233,3333$$

The smallest positive ratio is 50, which occurs in the s_4 row. Therefore, s_4 is selected as the leaving variable, x_3 becomes the entering variable, and 4 is identified as the pivot element. The elementary row operations using Gauss–Jordan elimination produce the first iteration tableau.

First Iteration

After dividing the pivot row by the pivot element and setting all other elements in the x_3 column to zero, the first simplex iteration tableau is obtained, as presented in Table 2.

Table 2. First Simplex Iteration Tableau

Basic Variables	x_1	x_2	x_3	s_1	s_2	s_3	s_4	s_5	NK
s_1	13,8000	9,9667	0	1	0	0	−2,6600	0	668
s_2	1,4000	1,5000	0	0	1	0	−0,4000	0	120
s_3	0	3,0000	0	0	0	1	0	0	150
x_3	0	0	1	0	0	0	0,2500	0	50
s_5	0,6000	1,3333	0	0	0	0	−0,4500	1	330
Z	−20.000	−50.000	0	0	0	0	15.000	0	3.000.000

Table 2 shows that x_3 has become a basic variable with a value of 50. This means that, in the first iteration, the model produces 50 units of Yellow Tofu, with a temporary objective function value of IDR 3,000,000. However, this solution is not yet optimal because negative coefficients remain in the Z row, namely −20,000 in the x_1 column and −50,000 in the x_2 column.

The most negative coefficient is −50,000; therefore, x_2 is selected as the entering variable for the next iteration. The positive ratios in the x_2 column are calculated as follows:

$$\frac{668}{9,9667} = 67,0227$$
$$\frac{120}{1,50} = 80$$
$$\frac{150}{3} = 50$$
$$\frac{330}{1,3333} = 247,5$$

The smallest positive ratio is 50 in the s_3 row. Therefore, s_3 is selected as the leaving variable, x_2 becomes the entering variable, and 3 is identified as the pivot element.

Second Iteration

The Gauss–Jordan elimination procedure is performed again to make the pivot element equal to one and all other elements in the x_2 column equal to zero. The results of the second iteration are presented in Table 3.

Table 3. Second Simplex Iteration Tableau

Basic Variables	x_1	x_2	x_3	s_1	s_2	s_3	s_4	s_5	NK
s_1	13,8000	0	0	1	0	−3,3222	−2,6600	0	169,6667
s_2	1,4000	0	0	0	1	−0,5000	−0,4000	0	45
x_2	0	1	0	0	0	0,3333	0	0	50
x_3	0	0	1	0	0	0	0,2500	0	50
s_5	0,6000	0	0	0	0	−0,4444	−0,4500	1	263,3333
Z	−20.000	0	0	0	0	16.666,67	15.000	0	5.500.000

Based on Table 3, x_2 and x_3 have become basic variables with values of 50 each. This temporary combination results in an objective function value of IDR 5,500,000. However, the coefficient of x_1 in the Z row remains −20,000. This indicates that the objective function value can still be increased by introducing x_1 into the basis.

The positive ratio in the x_1 column is calculated as follows:

$$\frac{169,6667}{13,80} = 12,2947$$

$$\frac{45}{1,40} = 32,1429$$

$$\frac{263,3333}{0,60} = 438,8888$$

The smallest positive ratio is 12.2947 in the s_1 row. Therefore, s_1 is selected as the leaving variable, x_1 becomes the entering variable, and 13.80 is identified as the pivot element.

Third Iteration

After performing the Gauss–Jordan elimination on the pivot element 13.80, the third simplex iteration tableau is obtained. The results of the third iteration, which also constitute the optimal tableau, are presented in Table 4.

Table 4. Third Simplex Iteration Tableau or Optimal Table

Basic Variables	x_1	x_2	x_3	s_1	s_2	s_3	s_4	s_5	NK
x_1	1	0	0	0,0725	0	−0,2407	−0,1928	0	12,2947
s_2	0	0	0	−0,1014	1	−0,1630	−0,1301	0	27,7874
x_2	0	1	0	0	0	0,3333	0	0	50
x_3	0	0	1	0	0	0	0,2500	0	50
s_5	0	0	0	−0,0435	0	−0,3000	−0,3343	1	255,9565
Z	0	0	0	1.449,28	0	11.851,85	11.144,93	0	5.745.893,72

Table 4 shows that all coefficients of the decision variables in the Z row are equal to zero, and there are no negative coefficients remaining. Therefore, the iteration process is terminated because the optimal solution has been reached. The decision variables that become basic variables are x_1, x_2, and x_3, with the following values:

$$x_1 = 12,2947,\ x_2 = 50,\ x_3 = 50$$

The value in the NK column of the Z row indicates that the maximum profit from the continuous solution is IDR 5,745,893.72 per day. In addition, the slack variables s_2 and s_5 remain positive, with values of 27.7874 and 255.9565, respectively. These values indicate that 27.7874 liters of vinegar and 255.9565 minutes of production time remain unused.

Meanwhile, s_1, s_3 and s_4 are not basic variables and therefore have values equal to zero. This indicates that soybeans, cooking oil, and turmeric are fully utilized in the optimal solution.

Production Combination and Maximum Profit

Based on the optimal simplex tableau, the continuous production combination consists of 12.2947 units of White Tofu, 50 units of Fried Tofu, and 50 units of Yellow Tofu. A summary of the production quantities and profit contributions of each product is presented in Table 5.

Table 5. Production Combination and Profit Contribution in the Continuous Solution

Product Type	Production volume (barrels)	Profit per barrel (Rp)	Profit contribution (Rp)
White Tofu	12,2947	20.000	245.893,72
Fried Tofu	50	50.000	2.500.000,00
Yellow Tofu	50	60.000	3.000.000,00
Total	112,2947		5.745.893,72

Table 5 shows that Yellow Tofu provides the largest profit contribution, amounting to IDR 3,000,000, or approximately 52.21% of the total profit. Fried Tofu contributes IDR 2,500,000, or approximately 43.51%, while White Tofu contributes IDR 245,893.72, or approximately 4.28%.

The maximum profit can be verified by substituting the production quantities into the objective function:

$$Z = 20.000(12{,}2947) + 50.000(50) + 60.000(50)$$
$$Z = 245.893{,}72 + 2.500.000 + 3.000.000$$
$$Z_{\max} = Rp5.745.893{,}72$$

The substantial profit contributions of Yellow Tofu and Fried Tofu indicate that these two products play a major role in profit generation. However, their production quantities are determined not only by the profit per unit but also by the availability of specific raw materials required for each product.

Adjustment of the Solution for Operational Implementation

The simplex solution of 12.2947 units of White Tofu represents a continuous solution. In actual production, this quantity may be difficult to implement if one production unit cannot be divided. Therefore, the production quantity of White Tofu is rounded down to 12 units to ensure that resource utilization does not exceed the available capacity.

A comparison between the continuous solution and the operational recommendation is presented in Table 6.

Table 6. Comparison of the Continuous Solution and the Operational Recommendation

Product Type	Continuous solution (barrel)	Operational recommendation (barrel)	Difference
White Tofu	12,2947	12	0,2947
Fried Tofu	50	50	0
Yellow Tofu	50	50	0
Profit (Rp)	5.745.893,72	5.740.000,00	5.893,72

Table 6 shows that the adjustment is made only to the production quantity of White Tofu, while the production quantities of Fried Tofu and Yellow Tofu are maintained at 50 units each. The operational recommendation results in a profit of:

$$Z = 20.000(12) + 50.000(50) + 60.000(50)$$
$$Z = 240.000 + 2.500.000 + 3.000.000$$
$$Z = Rp5.740.000$$

The difference in profit between the continuous solution and the operational recommendation is IDR 5,893.72. The percentage decrease is calculated as follows:

$$\frac{Rp5.893{,}72}{Rp5.745.893{,}72} \times 100\% = 0{,}103\%$$

The 0.103% decrease in profit is considered negligible. Therefore, a production combination of 12 tubs of white tofu, 50 tubs of fried tofu, and 50 tubs of yellow tofu can be recommended as a more practical production plan. However, this adjustment represents a feasible solution derived from rounding rather than an integer linear programming solution. Testing using an integer programming model could be conducted in future research.

Resource Usage Analysis

In addition to generating production combinations, the simplex method provides information regarding the usage and remaining capacity of each resource. Resource usage for the continuous solution is calculated by substituting the values $x_1 = 12{,}2947$, $x_2 = 50$, and $x_3 = 50$ into each constraint function. The results of these calculations are presented in Table 7.

Table 7. Resource usage for the continuous solution

Resource	Capacity	Usage	Remaining	Usage Rate	Status
Soybeans (kg)	1.200	1.200,00	0,00	100,00%	Active
Vinegar (liters)	200	172,21	27,79	86,11%	Inactive
Cooking oil (liters)	150	150,00	0,00	100,00%	Active
Turmeric (kg)	200	200,00	0,00	100,00%	Active
Production time (minutes)	420	164,04	255,96	39,06%	Inactive

Based on Table 7, soybeans, cooking oil, and turmeric are fully utilized (100% usage), making them active or binding constraints. The availability of these three ingredients directly limits the achievable production volume.

Vinegar usage amounts to 172.21 liters out of a 200 liter capacity, leaving a surplus of approximately 27.79 liters. Production time utilized is approximately 164.04 minutes out of a 420-minute capacity, leaving a surplus of approximately 255.96 minutes. Thus, vinegar and production time are inactive or nonbinding constraints. The significant amount of remaining time indicates that increasing working hours is not currently a priority for boosting production. Increasing production capacity depends more on the availability of soybeans, cooking oil, and turmeric. Unless the quantities of these limiting ingredients are increased, simply extending working hours will not raise maximum profit. Resource usage following the adjustment of production volume to operational units is presented in Table 8.

Table 8. Resource usage under operational recommendations

Resource	Capacity	Usage	Remaining	Utilization Rate
Soybeans (kg)	1.200	1.195,60	4,40	99,63%
Vinegar (liters)	200	171,80	28,20	85,90%
Cooking oil (liters)	150	150,00	0,00	100,00%
Turmeric (kg)	200	200,00	0,00	100,00%
Production time (minutes)	420	163,87	256,13	39,02%

Table 8 shows that the operational combination does not exceed resource capacities. Cooking oil and turmeric are fully consumed, whereas approximately 4.40 kg of soybeans remain. There is also significant remaining capacity regarding vinegar and production time. Thus, the combination of 12 tubs of white tofu, 50 tubs of fried tofu, and 50 tubs of yellow tofu is feasible based on the synthetic data used.

Discussion of Optimization Results

The optimization results demonstrate that the product with the highest profit per unit is not necessarily the only one produced. Yellow tofu yields the highest profit Rp 60,000 per tub but its production is constrained by the availability of turmeric. Given a turmeric capacity of 200 kg and a requirement of four kilograms per tub, the maximum quantity of yellow tofu that can be produced is:

$$x_3 = \frac{200}{4} = 50 \text{ tong}$$

Fried tofu yields a profit of Rp50,000 per batch, but production is limited by the cooking oil supply. With a cooking oil capacity of 150 liters and a requirement of three liters per batch, the maximum quantity of fried tofu is:

International Journal Of Health, Engineering And Technology (IJHET) E-ISSN 2829 - 8683
Volume 5, Number 3, September 2026, Page. 3362 - 3371
Email : editorijhess@gmail.com

$$x_2 = \frac{150}{3} = 50 \text{ tong}$$

Once the production of fried tofu and yellow tofu reached maximum capacity, the remaining soybeans were used to produce white tofu. This explains why the optimal solution included white tofu, even though its profit per barrel was lower than that of the other two products. These findings demonstrate that profit per product cannot be the sole basis for production decisions; decisions must also account for resource requirements and the interdependencies of raw material usage across products. Linear programming integrates these aspects into a single model, allowing for the systematic determination of the optimal production mix.

The results align with Susanti [6], who showed that the simplex method could determine a tofu production mix yielding maximum profit. They also support the work of Puspita et al. [7], who utilized the simplex method and POM-QM to determine optimal production levels for a tofu business. In a broader context, Solaja et al. [5] explain that linear programming assists business managers in allocating limited production resources toward a more profitable product mix.

This study differs from previous research in its specification of decision variable units and its post-optimization resource analysis. Each decision variable is expressed in barrels, while raw material coefficients represent usage per barrel; production time is likewise expressed in minutes across constraint equations. Such unit consistency is essential for the correct interpretation of model results.

Slack variable analysis provides additional insights for decision-making. The two specialized ingredients cooking oil for fried tofu and turmeric for yellow tofu were fully consumed in the optimal solution, as was the primary raw material, soybeans. Conversely, vinegar and production time remained unused. These results indicate that simply increasing working hours is an insufficient strategy for boosting production; management needs to consider increasing the supply of soybeans, cooking oil, and turmeric simultaneously.

Despite yielding clear recommendations, this study has limitations. First, the use of synthetic data means the optimization results do not reflect the actual conditions of a specific SME. Second, the model assumes that all produced goods can be sold. Third, changes in raw material prices, profit margins, product spoilage, and demand fluctuations have not been taken into account. Fourth, the simplex method yields continuous solutions; consequently, production quantities must be adjusted to whole units via rounding while ensuring all constraints remain satisfied.

Applying the model to actual SMEs requires real-world data on raw material usage, production capacity, working hours, profit margins, and product demand. Future developments could incorporate maximum demand limits, storage capacity, product shelf life, and minimum production quantities. An integer linear programming model could also be employed to obtain production quantities directly in whole units (barrels).

CONCLUSION

Based on the optimization results using Linear Programming with the Simplex method, the optimal continuous production mix yielding the maximum daily profit for Bapak Rezeki Tofu SME consists of 12.2947 barrels of White Tofu, 50 barrels of Fried Tofu, and 50 barrels of Yellow Tofu, generating a maximum profit of IDR 5,745,893.72 per day. For practical operational implementation, adjusting the production volume to 12 barrels of White Tofu, 50 barrels of Fried Tofu, and 50 barrels of Yellow Tofu yields a daily profit of IDR 5,740,000.00. This operational adjustment causes a negligible profit reduction of only 0.103%, proving to be highly feasible for daily planning. Furthermore, the slack variable analysis reveals that soybeans, cooking oil, and turmeric function as binding constraints (100% utilization), whereas vinegar (27.79 liters remaining) and production time (255.96 minutes remaining) remain inactive constraints.

The managerial implication of these findings suggests that efforts to expand production capacity and boost overall profitability should prioritize securing additional supplies of key raw materials (soybeans, cooking oil, and turmeric) rather than extending operational working hours. While the Simplex method effectively serves as a systematic decision-support tool for resource allocation, this study is limited by the reliance on simulated data and continuous variable assumptions. Future research should focus on validating these results with empirical operational data from SMEs and applying Integer Linear Programming (ILP) models to obtain direct integer-based solutions.

REFERENCES

Agung, I. G., & Lestari, K. (2025). *Tantangan Akses Pembiayaan UMKM Terhadap Lembaga Keuangan Formal di Indonesia*. *4*(2), 1–11.

Ahammed, T. (2018). *Impact of Fourth Industrial Revolution (4IR) on Small and Medium Enterprises (SMEs) and Employment in Bangladesh: Opportunities and Challenges*.

Ali, A. A., Hegaze, M. M., & Elrodesly, A. S. (2019). *Maximizing the Onboard Capability of the Spacecraft Attitude Control System Based on Optimal Use of Reaction Wheels*. *52*(4), 397–407.

Anggraeni, W. A. (2025). *Digital Readiness and Tax System Usability: A Structural Framework for MSME Compliance in Emerging Economies*. (3), 209–218.

Baki, S. M., & Cheng, J. K. (2020). *A Linear Programming Model for Product Mix Profit Maximization in A Small Medium Enterprise Company*. *06*(01), 8–17.

Clacier, R., Fitriani, R., & Wahyudin, W. (2023). Optimalisasi Keuntungan Menggunakan Program Linier dengan Metode Simpleks dan POM-QM pada Produksi Tahu. *Jurnal Serambi Engineering*, *8*(2), 5162–5169. https://doi.org/10.32672/jse.v8i2.5721

Khairani, R., & Tantono, E. A. (2025). *Unlocking the Potential of Financial Inclusion, E-Commerce, and FinTech to Boost SME Performance 3565*. *13*(5), 3565–3576. https://doi.org/10.37641/jimkes.v13i5.3786

Mile, B. N., Ijirshar, V. U., & Ijirshar, M. Q. (n.d.). *THE IMPACT OF SMEs ON EMPLOYMENT CREATION IN MAKURDI METROPOLIS*. (2009).

Mohamed, M., & Weber, P. (2019). *Trends of digitalization and adoption of big data & analytics among UK SMEs: Analysis and lessons drawn from a case study of 53 SMEs*.

Mon, K. K. (2019). *Simplex Method for Solving Maximum Problems in Linear Programming*. *8*(09), 410–411.

Nakai, E. (2021). *Spaces of Pointwise Multipliers on Morrey Spaces and Weak Morrey Spaces*. (1), 1–18.

Primafira, A., Eka, B., Sari, S., Tamzil, F., & Anggraeni, D. (2024). *Optimizing Digital Applications for MSMEs In Operational Efficiency and Encouraging the Acceleration of the Digital Economy*. *13*(03), 173–179. https://doi.org/10.54209/ekonomi.v13i03

Puspita, D. A. G., Jati, F. S., Azahara, F. N., Ramadhani, M. R., & Susanto, R. (2022). Maksimalisasi Pendapatan Produksi Tahu di Pabrik Tahu 2 Putri Menggunakan Metode Simpleks dan POM-QM. *Prosiding HUBISINTEK*, *2*(1).

Rusdiana, A., Rusdian, B., Siti, A., Alfira, N., Adkhilni, H., & Waliatul, T. (2024). *Optimizing MSMEs Profits using the Simplex Method*. *2*(1).

Solaja, O., Abiodun, J., Abioro, M., Ekpudu, J., & Olasubulumi, O. (2019). *Application of linear programming techniques in production planning*. *9*(3), 11–19.

Susanti, V. (2021). *Optimalisasi Produksi Tahu Menggunakan Program Linear Metode Simpleks*. *09*(02), 399–406.

Waruwu, M. (2024). *Pendekatan Penelitian Kualitatif: Konsep, Prosedur, Kelebihan dan Peran di Bidang Pendidikan*. *5*, 198–211.

Wei, D. (2020). *Modeling and Simulation of a Multi-agent Green Supply Chain Management System for Retailers*. *53*(4), 549–557.