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# Poverty Alleviation Model in Tasikmalaya City: An Analytic Network Process Approach (ANP)

## ABSTRAK

Penanggulangan kemiskinan membutuhkan strategi multidimensi yang berkelanjutan, mencakup pemberdayaan, kesejahteraan, dan investasi. Studi ini menerapkan *Analytic Network Process* (ANP) untuk mengevaluasi strategi pengentasan kemiskinan di Kota Tasikmalaya, Indonesia. Data diperoleh melalui perbandingan berpasangan dari para ahli dan dianalisis dengan perangkat lunak SuperDecisions. Hasil penelitian menunjukkan bahwa Pemberdayaan Kewirausahaan menjadi prioritas utama (34,7%), diikuti Jaminan Sosial (29,0%), Investasi Daerah (24,8%), dan Penyediaan Kebutuhan Pokok (11,5%). Analisis sensitivitas menegaskan konsistensi hasil, di mana pemberdayaan tetap dominan pada berbagai skenario parameter. Kebaruan penelitian ini terletak pada pengintegrasian strategi pemberdayaan dan kesejahteraan dengan sub-kriteria kontekstual dalam model ANP tingkat kota. Temuan ini mendukung Tujuan Pembangunan Berkelanjutan (SDG 1) dan menekankan pemberdayaan sebagai landasan pengentasan kemiskinan berkelanjutan di Indonesia.

**Kata kunci**: penanggulangan kemiskinan, *analytic network process*, pemberdayaan, jaminan sosial, Indonesia, SDGs
**Klasifikasi JEL**: I32, O21, R58

## ABSTRACT

Poverty alleviation requires a sustainable multidimensional strategy encompassing empowerment, welfare, and investment. This study applies the Analytic Network Process (ANP) to evaluate poverty reduction strategies in Tasikmalaya City, Indonesia. Data were collected through pairwise comparisons from experts and analyzed using the SuperDecisions software. The results indicate that Entrepreneurship Empowerment is the top priority (34.7%), followed by Social Security (29.0%), Regional Investment (24.8%), and Provision of Basic Needs (11.5%). Sensitivity analysis confirms the consistency of results, where empowerment remains dominant under various parameter scenarios. The novelty of this study lies in integrating empowerment and welfare strategies with contextual sub-criteria in a city-level ANP model. These findings support Sustainable Development Goal (SDG 1) and emphasize empowerment as the foundation for sustainable poverty alleviation in Indonesia.

**Keywords**: poverty alleviation, analytic network process, empowerment, social protection, Indonesia, SDGs
**JEL Classification**: I32, O21, R58

## INTRODUCTION

Poverty in Indonesia, particularly in urban areas such as Tasikmalaya City,

remains a significant challenge. This issue is exacerbated by structural factors such as low education levels, limited access to capital, and scarce employment opportunities. Low educational attainment restricts economic mobility and job opportunities, thereby reinforcing the cycle of poverty (Susanti, 2013). High urban unemployment further worsens the situation (Sari, Khusna, & Wulandari, 2023). Moreover, limited financial access hinders entrepreneurship and local economic growth (Suryahadi, Raya, Marbun, & Yumna, 2011).

Government efforts through short-term programs, such as subsidies, often fail to address the root causes of poverty. Hence, a more holistic empowerment strategy is required. For instance, the PNPM Mandiri program encourages community participation, strengthens local institutions, and provides training and funding (Sukidjo, 2009). Conditional fiscal transfers have also been shown to increase agricultural productivity, create jobs, and reduce poverty (Qomariyah, Suharno, & Priyarsono, 2017). Effective poverty reduction strategies combine social protection with community empowerment (Suryahadi et al., 2011). However, short-term assistance risks fostering dependency, making a shift toward sustainable development aligned with SDG 1 essential.

Two main approaches exist: welfare-based interventions and empowerment-based strategies. Welfare interventions, such as cash transfers and food programs, are effective in reducing immediate poverty but may foster dependency (Khan, 2013; Ikegami et al., 2016). Conversely, empowerment strategies enhance skills, entrepreneurship, and access to microfinance, supporting long-term economic growth (Monterrosa & Martínez, 2009; Silva, 2014). Yet, without adequate social protection, vulnerable groups remain at high risk (Ikegami et al., 2016). Therefore, combining both approaches is crucial.

The Analytic Network Process (ANP) is relevant because it models interdependencies and feedback among elements, unlike AHP, which assumes independence (Saaty, 2004). ANP has been applied in complex contexts such as substance abuse prevention (Atan et al., 2016) and supplier selection (Hidayat et al., 2019). However, its complexity requires consistent judgments to ensure reliable results.

ANP has been widely used in policy research, particularly in sustainability, energy, and poverty reduction issues. Examples include low-carbon urban planning in China (Lei et al., 2023), renewable energy policies in Central America (Castellanos, 2022), and women empowerment strategies in Indonesia (Khalifah et al., 2017). Nonetheless, applications of ANP for city-level poverty alleviation remain limited.

This study addresses the necessity of adopting a multidimensional poverty alleviation strategy, as poverty is shaped by interconnected economic, social, and institutional factors (Masset & García-Hombrados, 2021; Mitchell & Maccío, 2021). Accordingly, the objective of this study is to determine priority poverty alleviation strategies in Tasikmalaya City using the Analytic Network Process (ANP), which is capable of modeling

interdependencies among relevant criteria. This study integrates welfare-based and empowerment-based strategies while considering contextual sub-criteria such as lifestyle, gender policies, and access to production factors. The findings are expected to generate more comprehensive and sustainable policy recommendations for poverty reduction in Tasikmalaya City. Based on this objective, the explicit research question of this study is: What multidimensional poverty alleviation strategy should be prioritized in Tasikmalaya City, and how can ANP model interdependent criteria to support policy decision-making?

## RESEARCH METHODOLOGY

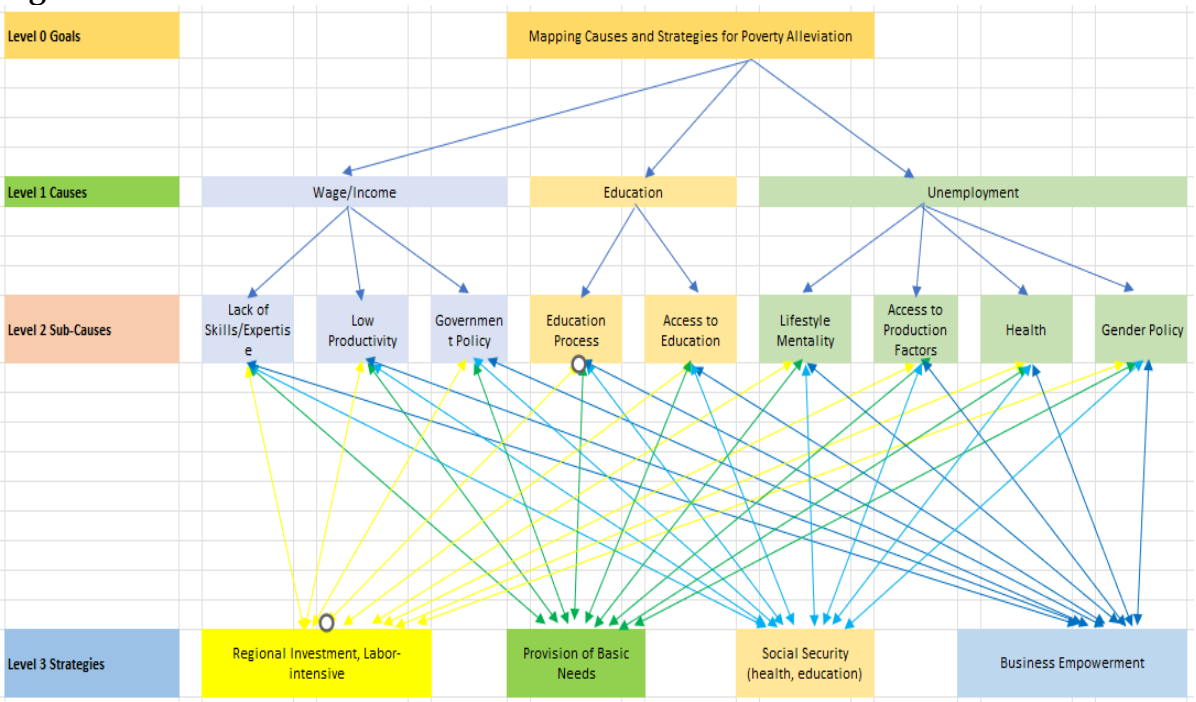
### Research Design

This study employs a quantitative approach using ANP. The model includes:

- **Goal**: Determining poverty alleviation priorities in Tasikmalaya City.
- **Criteria**: Income, Education, Employment.
- **Sub-criteria**: Skills, Productivity, Government Policy, Education Process, Education Access, Lifestyle, Access to Production Factors, Health, Gender Policy.
- **Alternatives**: Entrepreneurship Empowerment, Social Security, Regional Investment, Provision of Basic Needs.

The structural framework of the research model is illustrated in **Figure 1**.

**Figure 1. Structural Model of ANP**




The figure illustrates the ANP structural framework employed in this study. It consists of the research goal, main criteria, sub-criteria, and alternative poverty alleviation strategies. The interrelationships among elements demonstrate the

dependencies analyzed through the ANP approach.

**Data Collection**

Respondents consisted of 20 individuals, including 17 policymakers from Tasikmalaya City and 3 academics. Respondents were purposively selected based on their direct involvement in poverty policy. The instrument was a pairwise comparison questionnaire (Saaty's 1–9 scale). The Consistency Ratio (CR) ≤ 0.08, indicating reliability of judgments.

**Data Analysis**

The ANP procedure is particularly relevant because it allows policymakers to evaluate poverty alleviation alternatives while accounting for feedback effects among criteria such as education, employment, and income, which cannot be captured through independent weighting methods.

Data were processed using SuperDecisions v3.2 through the following steps:

- Constructing the unweighted supermatrix,
- Normalizing into the weighted supermatrix,
- Iterative multiplication until convergence (limit matrix),
- Extracting final priorities, and
- Conducting sensitivity analysis.

## RESULTS AND DISCUSSION

**Results**

**Unweighted and Weighted Supermatrix**

The unweighted supermatrix shows interrelations among sub-criteria. For instance, skills have a weight of 0.228 toward Regional Investment, higher than productivity (0.158). After normalization, proportional weights were obtained to prevent cluster dominance, highlighting human capital (skills and productivity) as dominant factors.

**Limit Matrix**

The limit matrix results indicate global priorities:

**Table 1. Limit Matrix**

| Alternatives | Global Weight |
|---|---|
| Entrepreneurship Empowerment | 0.172 |
| Social Security | 0.148 |
| Regional Investment | 0.121 |
| Provision of Basic Needs | 0.059 |

Source: Authors' own processing of data

Final Ranking of Alternatives

Normalized weights produced the final ranking :

**Table 2. Alternative Ranking**

| Rank | Alternative | Normalized Weight |
|---|---|---|
| 1 | Entrepreneurship Empowerment | 0.347 (34.7%) |
| 2 | Social Security | 0.290 (29.0%) |
| 3 | Regional Investment | 0.248 (24.8%) |

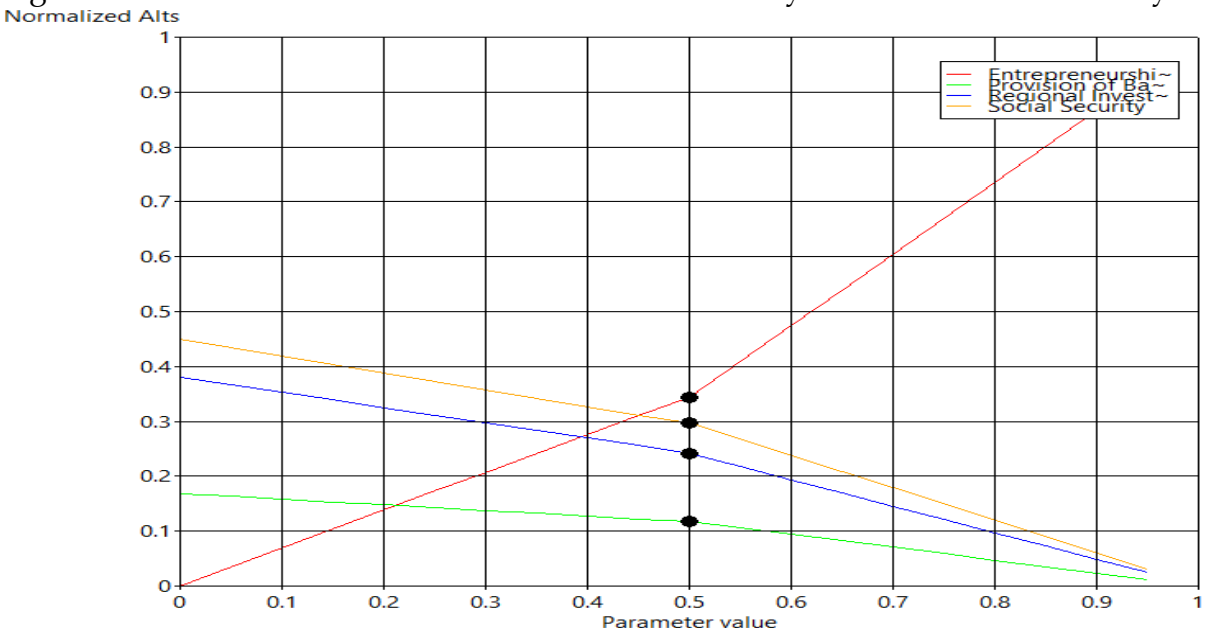
| | | |
|---|---|---|
| 4 | Provision of Basic Needs | 0.115 (11.5%) |

Source: Authors' own processing of data

**Sensitivity Analysis**

Sensitivity analysis varied parameter weights. Under baseline conditions (parameter value ~0.5), the strategy order was: Entrepreneurship Empowerment (0.35), Social Security (0.30), Regional Investment (0.25), and Provision of Basic Needs (0.10). Even when Regional Investment weights increased under certain scenarios, empowerment consistently remained the top priority, while provision of basic needs was always ranked last.

Figur 1 Sensitivity Analysis




Source: Authors' own processing of data

**Discussion**

The findings underscore Entrepreneurship Empowerment as the primary strategy for poverty alleviation in Tasikmalaya City, with the highest weight (34.7%). This suggests that enhancing individual capacity through skills, access to capital, and business mentoring produces more immediate and direct welfare improvements than other strategies. Its robustness is reinforced by sensitivity analysis, which consistently ranks empowerment first across parameter variations. Thus, entrepreneurship empowerment serves as the cornerstone of sustainable local economic development.

This result further reinforces recent evidence that multidimensional poverty evaluation is essential for designing policy interventions that address multiple deprivation dimensions simultaneously, rather than relying solely on single-indicator poverty measures (Masset & García-Hombrados, 2021; Mitchell & Maccío, 2021).

Social Security ranked second (29.0%). It functions as a safety net for vulnerable groups at risk of falling deeper into poverty due to economic or social shocks. However, being more protective than productive, its long-

term contribution is weaker than empowerment. Nevertheless, social security remains essential for creating social stability that supports empowerment programs. This reinforces the argument that both are necessary: empowerment as the growth engine and social security as the resilience pillar.

Regional Investment (24.8%) ranked third. While it has significant potential in generating employment, improving infrastructure, and opening market access, its effects are medium- to long-term, thus less immediate compared to empowerment. Nonetheless, this finding highlights the role of local government in allocating budgets and policies that integrate investment with community empowerment programs.

Provision of Basic Needs ranked last (11.5%). Although important in meeting basic needs and preventing short-term social unrest, its contribution to sustainable poverty alleviation is limited. The data suggest that purely charitable approaches are less effective without transformative strategies. This aligns with literature warning that short-term assistance risks perpetuating dependency on government support.

Overall, these findings emphasize the need for a policy shift from consumptive assistance toward capacity building. Integrating empowerment, social security, and regional investment is key to a more comprehensive poverty alleviation strategy. The ANP model also provides methodological advantages by mapping interrelations among sub-criteria—such as the dominance of skills and productivity in enhancing entrepreneurship empowerment.

Practically, this study implies that Tasikmalaya City should strengthen programs for skill development, MSME financing access, and building an entrepreneurial ecosystem for the poor to achieve economic independence, while maintaining social security and accelerating regional investment realization.

The prominence of entrepreneurship empowerment aligns with international literature stressing sustainable poverty alleviation through economic inclusion. Studies show that microfinance and vocational training significantly increase income and reduce poverty. The dominance of this strategy in the ANP model for Tasikmalaya City provides empirical support for the argument that empowering individuals, rather than merely providing short-term aid, is a more effective long-term solution. This finding underscores the necessity of shifting policy focus from welfare-centered approaches to holistic, empowerment-driven frameworks addressing structural poverty determinants.

## CONCLUSION

This study applies ANP to prioritize poverty alleviation strategies in Tasikmalaya City. The results rank Entrepreneurship Empowerment (34.7%) as the top priority, followed by Social Security (29.0%), Regional Investment (24.8%), and Provision of Basic Needs (11.5%). The novelty lies in integrating empowerment and welfare strategies with contextual sub-criteria. Sensitivity analysis reinforces the finding that empowerment consistently emerges as the dominant strategy.

This study contributes by providing a city-level multidimensional poverty alleviation prioritization model using ANP, which captures interdependent criteria beyond conventional AHP or descriptive approaches.

**Recommendations for future research**: Future studies should address limitations by involving a larger and more diverse respondent base, including community organizations and beneficiaries, to validate priorities from grassroots perspectives. Integrating ANP with quantitative household survey data would also strengthen policy recommendations. Furthermore, hybrid approaches such as Fuzzy-ANP could better address ambiguity and subjectivity in expert judgments, enhancing model reliability and providing a more nuanced understanding of poverty dynamics.

## REFERENCE

Atan, M., Türe, H., & Koçak, D. (2016). Analitïk ağ süreci yöntemi ile gençlerde madde bağimliliği ve erken uyari sïstemïne ïlïşkïn bïr uygulama. 2016(24), 103–112. **https://dergipark.org.tr/en/download/article-file/411775**

Fiszbein, A., Kanbur, R., Kanbur, R., Kanbur, R., & Yemtsov, R. (2013). Social protection, poverty and the post-2015 agenda. World Bank. **https://doi.org/10.1596/1813-9450-6469**

Hidayat, S. W., Ahmadi, A., Agustiyani, I., & Agustian, I. (2019). The application of analytic network process anp methods for company profile selecting ( a case study ). 10(2), 54–63. **https://doi.org/10.37875/ASRO.V10I2.129**

Hukom, F. A. A., Arbiani, A., & Saribanon, N. (2021). The entrepreneurial capabilities for sustainability of community empowerment programs. 2(1), 89–98. **http://e-journal.unas.ac.id/index.php/jsps/article/download/45/41**

Ikegami, M., Carter, M. R., Barrett, C. B., & Janzen, S. A. (2016). Poverty Traps and the Social Protection Paradox (pp. 223–256). University of Chicago Press. **https://doi.org/10.7208/CHICAGO/9780226574448.003.0006**

Khalifah, M. H., Nurzaman, M., & Nafis, M. C. (2017). Optimization of BAZNAS Programs on Sustainable Development Goals (SDGs): Analytic Network Process Approach (ANP). 2(2), 71–83. **https://doi.org/10.37706/IJAZ.V2I2.26**

Khan, S. (2013). Safety Net, Social Protection, and Sustainable Poverty Reduction: A Review of the Evidences and Arguments for Developing Countries. IOSR Journal of Humanities and Social Science, 15(2), 23–29. **https://doi.org/10.9790/0837-1522329**

Lei, Q., Lau, S. S. Y., Fan, Y. J., Fu, I. C. S., Chan, J. T. Y., Tao, Y. Q., Zhang, L., Lai, H., Miao, Y., & Qi, Y. (2023). From Policy to Implementation—An Analytic Network Process (ANP)-Based Assessment Tool for Low Carbon Urban and Neighborhood Planning. Buildings, 13(2), 484. **https://doi.org/10.3390/buildings13020484**

Masset, E., & García-Hombrados, J. (2021). *Sensitivity matters. Comparing the use of multiple indicators and of a multidimensional poverty index in the evaluation of a poverty eradication program.* World Development, 137, 105162. https://www.sciencedirect.com/science/article/abs/pii/S0305750X20302898

Mitchell, A., & Maccío, J. (2021). *Using multidimensional poverty measures in impact evaluation: Emergency housing and the "declustering" of disadvantage.* Journal of Human Development and Capabilities, 22(3), 379–402. https://www.tandfonline.com/doi/abs/10.1080/19452829.2020.1847052

Murillo Castellanos, J. C. (2022). A methodological framework to assist in the renewable energy policies of the Central American countries based on the Analytical Network Process (ANP). Revista de Fomento Social, 497–513. **https://doi.org/10.32418/rfs.2021.301.5166**

Pratama, M. P., & Helmy, I. (2023). Bantuan sosial, pembiayaan modal kerja dan kinerja umkm: peran moderasi entreprenurial resiliency. Jurnal Manajemen Dan Akuntansi, 18(2), 352–362. **https://doi.org/10.32534/jv.v18i2.3958**

Qomariyah, N., Suharno, S., & Priyarsono, D. S. (2017). Dampak transfer fiskal (conditional grant) terhadap pembangunan pertanian, kemiskinan dan ketimpangan di indonesia: analisis data panel. Agriekonomika, 6(2), 164–173. **https://doi.org/10.21107/AGRIEKONOMIKA.V6I2.1874**

Rhenals Monterrosa, R., & Martínez, L. E. (2009). La ayuda internacional al desarrollo: retórica y realidad. 14, 9–50. **http://www.scielo.org.co/pdf/pece/n14/n14a1.pdf**

Saaty, T. L. (2004). Fundamentals of the analytic network process — Dependence and feedback in decision-making with a single network. Journal of Systems Science and Systems Engineering, 13(2), 129–157. **https://doi.org/10.1007/S11518-006-0158-Y**

San Marino, W., & Gunawan, G. G. (2021). Poverty Reduction Through Microfinance in Rajapolah District, Tasikmalaya Regency. 244–247. **https://doi.org/10.2991/ASSEHR.K.210413.056**

Sánchez-Garrido, A. J., Navarro, I. J., García, J., & Yepes, V. (2022). An Adaptive ANP & ELECTRE IS-Based MCDM Model Using Quantitative Variables. Mathematics, 10(12), 2009.

Sari, D. T., Khusna, N., & Wulandari, F. S. (2023). Analisis tingkat kemiskinan di provinsi jawa tengah: suatu kajian berdasarkan faktor pendidikan, sosial, ekonomi, lokasi dan indeks pembangunan manusia. Jurnal PIPSI (Jurnal Pendidikan Ilmu Pengetahuan Sosial Indonesia), 8(1), 37. **https://doi.org/10.26737/jpipsi.v8i1.3978**

Silva e Silva, M. O. da. (2014). Panorama geral dos programas de transferência de renda na américa latina e caribe. Revista de Políticas

Públicas, 18, 299–306. **https://doi.org/10.18764/2178-2865.V18NEP299-306**

Sukidjo, S. (2009). Strategi pemberdayaan pengentasan kemiskinan pada pnpm mandiri. 2(2), 87829. **https://doi.org/10.21831/CP.V2I2.315**

Suryahadi, A., Raya, U., Marbun, D., & Yumna, A. (2011). Accelerating poverty and vulnerability reduction: Trends, opportunities and constraints (pp. 68–89). Institute of Southeast Asian Studies (ISEAS). **https://doi.org/10.1355/9789814345132-009**

Susanti, S. (2013). Pengaruh Produk Domestik Regional Bruto, Pengangguran dan Indeks Pembangunan Manusia terhadap Kemiskinan di Jawa Barat dengan Menggunakan Analisis Data Panel. 9(1), 1–18. **https://doi.org/10.24198/JMI.V9.N1.9374.1-18**

Tanaya, D. R., & Ekyawan, F. (2020). Empowerment Strategy on Micro, Small, and Medium Enterprises (MSMEs) during COVID-19 Pandemic in Indonesia: A Case Study of BRI Microfinance Center. 202, 03022. **https://doi.org/10.1051/E3SCONF/202020203022**

Wulandari, M., Anwar, Moch. K., & Munir, M. B. B. (2024). Pemberdayaan Ekonomi Perempuan Melalui Program Bank BTPN Syariah: Studi Literatur. El-Mal, 5(12). **https://doi.org/10.47467/elmal.v5i12.5366**