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An integrated socio-economic inclusion model for sustainable urban welfare: The mediating role of public services

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ABSTRACT

This study aims to develop an integrated socio-economic inclusion model to achieve sustainable urban welfare within the framework of Sustainable Development Goal (SDG) 11. The research is motivated by the urgent need for public policy interventions to address structural poverty amid rising living costs in urban informal settlements. Using a quantitative approach with 384 respondents, this study applies ANOVA, multiple linear regression, and SEM-PLS analysis to examine the complex relationships among the dimensions of inclusion. The findings classify the current level of socio-economic inclusion as "progressive," with health inclusion identified as the strongest predictor of improved community welfare. Furthermore, the SEM-PLS model confirms the strategic role of public services as both a mediator and a moderator, significantly strengthening the positive effects of the education, health, and economic sectors on welfare. This study concludes that achieving sustainable urban welfare requires a holistic policy model that integrates public service optimization with improved access to basic services to effectively break the cycle of poverty.

1. Introduction

In alignment with the United Nations Sustainable Development Goals (SDGs), particularly Goal 11 on creating inclusive, safe, resilient, and sustainable cities, the issues of socio-economic inclusion and urban poverty have become paramount in contemporary global discourse (Berisha et al., 2022; Nabiyeva et al., 2023). While urbanization is often viewed as a driver of growth, the rapid movement of populations into urban settings frequently exacerbates social exclusion, leading to systemic inequities in housing, essential services, and decent employment opportunities (Jha et al., 2022). These dynamics further marginalize vulnerable groups, necessitating robust inclusive strategies to bridge the widening socio-economic divide within urban landscapes.

Responding to these challenges, various nations have developed diverse policy models to foster socio-economic inclusion. In Europe, countries such as France and Italy utilize the "Social Economy and Solidarity" framework and cooperatives to integrate marginalized populations, while the UK employs Community Interest Companies to ensure institutional transparency. In Asia, South Korea incentivizes the employment of vulnerable groups through firm-level subsidization. Meanwhile, African nations like Nigeria and South Africa focus on financial inclusion by expanding access to banking and credit services (Ogunniyi et al., 2023). Similarly, Latin American countries, notably Brazil and Colombia, have achieved significant economic improvements through a combination of race-based inclusion policies, educational programs, and Conditional Cash Transfers (Reiter and Lezama, 2013).

Despite these varied global approaches, urban poverty remains inherently more complex than rural poverty due to the compounding effects of rapid urbanization, structural unemployment, and severe barriers to basic services (Boateng and Klopp, 2024; Guo et al., 2024). This complexity is clearly observed in Medan City, Indonesia, where established social safety nets, such as the Family Hope Program (PKH) and Non-Cash Food Assistance (BPNT), have yet to significantly reduce the poverty headcount. The limited impact of these initiatives is largely attributed to regional development disparities and a lack of functional integration among social programs.

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Exacerbated by a high cost of living, these structural barriers trap vulnerable individuals in long-term poverty, highlighting the urgent need for more effective, integrated inclusive strategies tailored to the urban context.

As the primary metropolitan hub and the largest city in Sumatra, Medan exemplifies the paradox where rapid economic growth fails to significantly alleviate urban poverty. Despite its strategic economic position, the number of residents living below the poverty line remains substantial, reaching 187,040 individuals. This persistent challenge indicates that the path toward socio-economic inclusion is far from optimized, largely due to widening economic inequality between various societal groups (Fan et al., 2023). This disparity manifests most visibly in the restricted access to basic services for the urban poor, particularly in education. Data from the Ministry of Education and Culture in 2023 further underscores this crisis, revealing that approximately 7,600 students at the elementary and junior high school levels in North Sumatra—including Medan as the largest contributor—dropped out of school due to severe financial constraints. Such educational barriers not only reflect current inequalities but also threaten to perpetuate a cycle of structural poverty for future generations.

In addition to the many children from underprivileged families who cannot access quality education, health services are also often uneven, with better facilities concentrated in certain areas (Bull et al., 2022). For example, the existence of maternity hospitals and auxiliary health centers is still very limited in the city of Medan. According to the data, there are only seven maternity hospitals and 40 auxiliary health centers in the city of Medan with uneven distribution. Meanwhile, malnutrition cases throughout 2013-2017 increased from 65 to 245 cases, then in February 2022 there were 550 cases and decreased to 251 children in October 2023.

Medan is currently undergoing a series of significant infrastructure transformations aimed at modernizing its urban landscape and enhancing the quality of life for its residents. These initiatives include the construction of strategic flyovers and underpasses, alongside the comprehensive revitalization of iconic public spaces such as Merdeka Square and Teladan Stadium. Beyond mere modernization, these projects are designed to bolster urban mobility and accessibility while providing sustainable, community-oriented environments (Omole et al., 2024). Within this context of rapid physical change, it is imperative to align such developments with the principles of environmental sustainability and socio-economic inclusivity to ensure that urban growth benefits all segments of society (Colavitti et al., 2020; Domenech and Borrion, 2022).

In this situation, socio-economic inclusivity is defined as a method of empowering the poor and getting them out of marginalization. This is done by offering them equal opportunities when it comes to services, education, employment, and finances. The economic inclusivity policies, when designed carefully, can improve the resilience of the urban poor and also reduce inequalities within the society (Sakamoto, 2024). The implementation of these policies relies heavily on the involvement of multiple sectors and the commitment of the government, private sector, and civil society for a long period of time. This multi-faceted strategy is essential for inclusion programs to be able to meet their goals and ensure equal accessibility for all (Singh and Singh, 2023).

Numerous studies have documented the multifaceted drivers of poverty in Medan City, with income inequality emerging as a primary catalyst. The widening gap between the wealthy and the marginalized significantly obstructs the latter's access to essential services, thereby stifling their ability to leverage broader economic opportunities (Batubara et al., 2023; Sharma, 2022). Closely linked to this systemic inequality is the suboptimal quality of human resources. A pervasive lack of formal education and technical skills severely limits the capacity of the urban poor to secure stable, high-quality employment. Evidence suggests that individuals trapped in this cycle of poverty are often unable to acquire the market-relevant skills necessary for upward mobility due to inadequate access to quality education (Sharma, 2022). In Medan, these structural challenges are further compounded by high unemployment rates and persistent economic stagnation, both of which serve as formidable barriers to community development and overall social inclusion.

Beyond human capital, the inadequate provision of essential services, such as healthcare, sanitation, and basic infrastructure, further entrenches poverty within the urban landscape. For instance, empirical evidence from Kampung Aur, Medan Maimun, highlights a significant correlation between deficient social amenities and persistent poverty; the area's poor sanitation and limited access to clean water create a cycle of deprivation that is difficult to break. These systemic gaps in healthcare and environmental services not only jeopardize public health but also lead to a direct loss of productivity and household income, further marginalizing vulnerable populations.

The persistence of these multifaceted issues, despite various interventions, suggests that current approaches are insufficient to alleviate urban poverty in Medan (Thamrin et al., 2024). This underscores an urgent need to profoundly rethink inclusive strategies by prioritizing integrated, cross-sectoral development policies. Rather than operating in institutional silos, a strengthened collaborative framework involving the government, the private sector, and civil society is a prerequisite for dismantling structural poverty.

While numerous studies have pinpointed some of the factors that cause poverty, few studies have addressed the development of particular,

contextually relevant, and tailored socio-economic inclusion policy models for Medan. Most studies, the few that do not focus exclusively on describing the causes of poverty, do so without providing a way out of the policy quagmire. Furthermore, there seems to be little, if any, systematic study devoted to assessing whether or not the socio-economic programs initiated by the government have succeeded in alleviating the poverty of the target beneficiaries. Without such studies, it is virtually impossible to evaluate the efforts made and the barriers encountered in the development of the socio-economic programs.

By proposing a comprehensive and integrated socio-economic inclusion policy in the context of Medan, this study seeks to fill the knowledge gap. Integrated policy models tend to focus on social or economic dimensions in isolation, which significantly undermines the models' ability to achieve a fragmented goal of poverty alleviation or empowering the poor in a truly holistic manner. This integrated policy model is designed to achieve a broad and diverse range of synergies in education, health, and economic development, and also takes into account the urban poor's experience in the implementation of public service policies.

2. Research method

This study is descriptive, evaluative, and correlational in nature and employs a quantitative approach. A quantitative approach was chosen because it allows for the collection of objective and measurable data, produces numerical data that can be statistically analyzed, and enables the generalization of results (Adeyemi, 2024). Descriptive: Aims to describe the phenomenon of socio-economic inclusion in Medan City. Evaluative: Aims to assess the socio-economic inclusion policies and programs of city governments based on empirical data. Correlative: Aims to identify and measure the influence between the level of socio-economic inclusion (in aspects of public services, economy, health, and education) and the welfare of the poor in Medan.

The city of Medan, North Sumatra, was chosen because it is one of the largest urban centers in Indonesia with significant social, economic, and ethnic diversity, faces the challenges of urbanization and poverty, and has local policy initiatives that need to be studied. Population: Poor people living in slums. It refers to individuals or families who are economically vulnerable, work in the informal sector, and are vulnerable to social exclusion. Population size: 187,040 inhabitants. The sample size of 384 respondents was obtained using Krejcie and Morgan (1970) with a 95% confidence level and a 5% margin of error.

The data collection method uses questionnaires as the main instrument, consisting of demographic questions, levels of socio-economic inclusion (public services, economy, health, education), the influence of these aspects on welfare, and participation constraints. The distribution was carried out directly (survey) using an enumerator. In addition, data collection is carried out through documentation through written documents, images, or other media, including official government documents, reports/case studies, media articles, and community documents.

The analysis method is as shown in Table 1. The use of a multi-stage analytical approach, comprising ANOVA, Multiple Linear Regression, and SEM-PLS, is necessary because each technique addresses a distinct layer of the research problem, moving from descriptive comparison to predictive priority and finally to complex system modeling.

The Validity Test is carried out to measure the extent to which the instrument measures what it should measure. Using the formula Correlation Coefficient (r calculated) and testing with the SPSS 25.0 program. The criteria are valid if r calculated > r table. Reliability tests are carried out to measure the consistency of measuring instruments. Using the SPSS 25.0 program with Cronbach's Alpha > 0.6 criteria (Adeyemi, 2024).

Table 1: Data analysis methods

Purpose of analysis	Analytical techniques	Hypothesis/criteria
Differences in inclusion levels (between aspects of public services, economy, health, education)	One-way ANOVA test	H0: There is no difference; H1: There are differences. Criteria: Sig ≤ 0.05; then H0 is rejected (There is a difference).
Socio-economic inclusion rate	Descriptive statistical analysis	Using class intervals divided into 4 tiers: Minimal, Partial, Progressive, and Optimal Social Inclusion
Influence of aspect (X) on welfare (Y)	Multiple linear regression	Model: $Y=\beta0+\beta1X1+\beta2X2+\beta3X3+\varepsilon$ (with X1 = Education, X2 = Health, X3 = Economy). Preceded by the Classical Assumption Test. Followed by the t-test. Criterion: Sig ≤0.05, then H0 is rejected (There is an effect).
Policy model	Structural equation modeling (SEM) based on partial least squares (PLS)	It is used to describe and test relationships between latent variables and develop a more holistic policy model, with the help of SmartPLS software.

Variable operational definitions include: Public Services (Z): Ease of access and quality of public services as well as opportunities to convey aspirations. Education (X_1): Ease of access, program information, and educational assistance. Health (X_2): Ease of access to basic health services and level of health program information. Economy (X_3): Ease of access to employment, training, and financial assistance.

Welfare (Y): real data on economic welfare (income and expenditure), social (number of dependents, internet access, participation), health (frequency of visits to hospitals/psychiatrists), and education (family education level).

3. Results and discussion

The respondents in this study are poor people in Medan City who are dominated by the productive age group (26-35 years) and have the last education of high school/vocational school, showing the existence of the phenomenon of working poor where the majority work full-time but have low income. Most respondents live in suburban areas with rented/contract residence status, which reinforces their economic vulnerability.

The majority have internet access, which indicates the potential for digital intervention, but they tend to rarely utilize hospital health services, which may reflect access and financial barriers. The rest is shown in Table 2.

Table 2: Key findings of respondent characteristics

Characteristic	Key findings
Age & gender Education & employment	Most of them are in the productive age of 26-35 years, a total of 96 people. The composition of the sex varies in each age group. The majority of them have high school/vocational school education, as many as 190 people. Most of the respondents worked full-time, but were still classified as working poor.
Income & expenses	The majority have a monthly income of IDR 1,000,000 – IDR 2,999,999 for a total of 175 people. The majority of expenses are also in the same range for 178 people. Comparison of Income vs. Expenditure shows an imbalance, reinforcing the phenomenon of working poor.
Residence	The majority live in the suburbs (232 people). The status of residence is dominated by Lease/Contract. Other significant locations are Informal Settlements, Riversides, and Railroad Suburbs.
Business ownership	There is a positive correlation: the higher the income, the more likely it is to own one's own business. Business ownership is the dominant path to achieve higher income among the poor.
Hospital visits	The majority rarely go to the hospital: < 2 times/Year a total of 266 respondents. This is interpreted as an obstacle to access (cost, distance) or undetectable health conditions, not a good indicator of health.

3.1. Differences in socio-economic inclusion levels

All significance values (Sig.) for each group in both tests (Kolmogorov-Smirnov and Shapiro-Wilk) were greater than 0.05; it can be concluded that the normality assumption is met. This means that the data in each group have a normal distribution, making it valid to use parametric statistical tests such as ANOVA. In the homogeneity test of the Sig. value (0.302) is greater than 0.05, the variance of the scores of "Public Service," "Education," "Health," and "Economy" can be considered the same. These results confirm that the ANOVA test is valid to perform.

In the ANOVA test, because the Sig. value (0.176) was greater than 0.05, there was no statistically significant difference between the average score in the Public Service, Education, Health, and Economic groups. These results are consistent with the interpretation of the Bonferroni test in Table 3. The Bonferroni test is used to perform *pairwise comparisons* after the ANOVA test shows a significant difference overall. This is one type of *post-hoc* test. From Table 3, it can be seen that all 'Sig.' values for each inter-group comparison are greater than 0.05:

1. Public Service vs. Education: The Sig. value is 1,000 (insignificant).
2. Public Service vs. Health: The Sig. value is 1,000 (insignificant).
3. Public Services vs. Economy: The Sig. value is 0.615 (insignificant).
4. Education vs. Health: The Sig. value is 1,000 (insignificant).
5. Education vs. Economy: The Sig. value is 0.868 (insignificant).
6. Health vs. Economy: The Sig. value is 0.236 (insignificant).

In addition, the 95% Confidence Interval column for all comparisons includes zeros (one negative border, one positive border), which further corroborates that there is no significant difference between the average scores in the population. Based on the results of the Bonferroni test, there was no statistically significant difference in average scores between the Public Service, Education, Health, and Economic groups. Although there are differences in mean values, they are not large enough to be considered significant at the 95% confidence level.

3.2. Socio-economic inclusion rate

Based on the results of the survey that has been conducted, the city of Medan has a score of 23,360. The score of 23,360 is in the range of 19,201 - 24,960, which means that the level of socio-economic inclusion of Medan City is at the Progressive level (Fig. 1). The results of statistical analysis (ANOVA and Bonferroni) show that there is no significant difference between the average score in each aspect (public services, health, education, and economy). These are key findings. This indicates that the performance of inclusion in these four aspects is at a relatively balanced level. This means that no one aspect is very far behind or even much more advanced than the others. This balance collectively pushes the overall score to a "Progressive," rather than "Partial" (if one aspect is very poor) or "Optimal" (if all aspects are excellent).

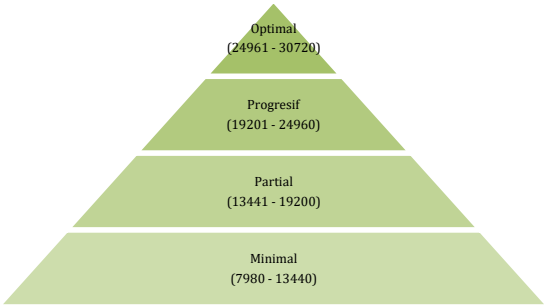

Fig. 1: Level of socio-economic inclusion in the city of Medan

Table 3: Bonferroni test

Inclusion (I)	Inclusion (J)	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
					Lower bound	Upper bound
Public service	Education	1.40000	7.04273	1.000	-19.7869	22.5869
	Health	-3.60000	7.04273	1.000	-24.7869	17.5869
	Economy	12.20000	7.04273	0.615	-8.9869	33.3869
Education	Public service	-1.40000	7.04273	1.000	-22.5869	19.7869
	Health	-5.00000	7.04273	1.000	-26.1869	16.1869
	Economy	10.80000	7.04273	0.868	-10.3869	31.9869
Health	Public service	3.60000	7.04273	1.000	-17.5869	24.7869
	Education	5.00000	7.04273	1.000	-16.1869	26.1869
	Economy	15.80000	7.04273	0.236	-5.3869	36.9869
Economy	Public Service	-12.20000	7.04273	0.615	-33.3869	8.9869
	Education	-10.80000	7.04273	0.868	-31.9869	10.3869
	Health	-15.80000	7.04273	0.236	-36.9869	5.3869

Dependent variable: Score

Achievements at the 'Progressive' level—when compared to the 'Minimal' or 'Partial' levels—reflect the commitment of the City of Medan and its stakeholders to expanding and improving access across various sectors. One concrete example is the City of Medan's health policy, which has fully implemented the Universal Health Coverage (UHC) program for the poor. This local initiative aligns with the Indonesian government's approach of prioritizing socioeconomic inclusion within the national policy framework. As a strategy to improve well-being, this has become a key pillar of the inclusive development agenda (Ozili, 2020). In the regional context, improving psychosocial literacy, empowering communities, and expanding access to financial services are key to enabling the people of Medan to achieve sustainable socioeconomic inclusion (Harahap et al., 2024).

From the perspective of inclusive development, balance across dimensions is a key indicator of substantial progress. If inclusion is partial—where one aspect is highly advanced while others remain stagnant—poverty alleviation efforts will be hindered by sectoral bottlenecks. However, these findings demonstrate that inclusion in Medan has progressed simultaneously and evenly across the public services, education, health, and economic sectors. This balance indicates that development policies do not focus solely on economic growth but also give equal attention to access to basic services. Therefore, the 'Progressive' designation in this study is not merely an absolute figure but a representation of equitable access, which is the primary foundation for achieving an 'Optimal' level of inclusion in the future.

3.3. Influence of aspect (X) on welfare (Y)

The socio-economic inclusion variable in health aspects (X_2) is the strongest and most significant predictor (Sig. value: 0.004) of well-being (Y). The increase has the most impact and is statistically significant. Meanwhile, the socio-economic inclusion variable in the aspect of education (X_1) showed a positive but not statistically significant influence (Sig. Value: 0.071).

Finally, the socio-economic inclusion variable in the economic aspect (X_3) has a positive but insignificant influence (Sig. value: 0.294) on welfare (Y) at a confidence level of 95%. In other words, of the three aspects of socio-economic inclusion studied, only inclusion in health aspects has a significant and positive relationship with the level of well-being. Based on Table 4, the Regression Equation obtained is as follows: Y = 748,844 + 11,130 X1 + 18,066 X2 + 2,004 X_3 + e.

The finding that only the health variable (X_2) is the most powerful and significant predictor of Well-being (Y) provides an in-depth interpretation of the priority of needs among the urban poor. Although Education and the Economy are the main pillars of inclusion, for the "working poor" (the majority of respondents work full-time but have low incomes), a serious illness or health problem can be an economic disaster that instantly wipes out assets and plunges them deeper into poverty.

Research shows that health issues among the urban poor are closely linked to socio-economic pressures. Those facing significant health challenges often experience a decline in economic stability, as medical emergencies can drain savings and resources, worsening their poverty. Research highlights how the "working poor," those who work full-time yet continue to live below the poverty line, are even more at risk. If their health is problematic, their financial situation is even worse, which amplifies the necessity to include health as a priority in any policy to address poverty.

The perspective is validated by the evidence that respondents who go to the hospital less than 2 times a year encounter health access and financial barriers. Many respondents live in slums, riverbanks, and railroad suburbs, which are overcrowded and where poor health (malnutrition or inadequate health services) limits their capacity to work and earn; thus, health is a determinant of the poverty of the population (Ogbonna et al., 2024).

The finding that health (X2) is the most significant predictor of well-being (p = 0.004) aligns with the sociological reality of the working poor in major Asian cities. In Kuala Lumpur, Malaysia, studies show that health pressures on the urban poor often trigger deeper psychological and social well-being crises than economic variables alone. The same was found in Kathmandu, where marginalized communities are highly vulnerable to sudden loss of livelihood due to physical disruptions (Dangol, 2024).

Table 4: Multiple linear regression analysis

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	Beta		
1	(Constant)	748.844	151.041		4.958	0.000
	X1	11.130	6.157	0.106	1.808	0.071
	X2	18.066	6.173	0.168	2.927	0.004
	X3	2.004	1.909	0.054	1.050	0.294

Why is health more dominant than education (X1) or the economy (X3)? For respondents in Medan, the majority of whom work full-time but have low incomes, education is a long-term investment whose benefits are not felt immediately. In contrast, health issues are “catastrophic shocks” capable of depleting their meager assets and bringing their income to a complete halt in an instant. While education and the economy offer opportunities for “moving up the ladder,” health serves as a basic safety net; without health, this group would be trapped in deepening structural poverty even if they possess job skills. Comparisons with policies in Brazil and Colombia also show that while conditional cash transfer programs are successful, their long-term impact is always mediated by how effectively basic health services reach the poorest segments of the population (Reiter and Lezama, 2013).

3.4. Socio-economic inclusion policy model

The Structural Equation Modeling (SEM) based on Partial Least Squares (PLS) was utilized to test the complex relationships between inclusion dimensions and urban welfare. Before testing the structural paths, the measurement model was evaluated for validity and reliability.

As Table 5 shows, the Average Variance Extracted (AVE) values for all variables (Education, Health, Economy, Public Services, and Welfare) were above the threshold of 0.500, with a range between 0.700 and 0.784. This indicates that the indicators in the questionnaire adequately capture the constructs being measured. Furthermore, although the Cronbach's Alpha values for some variables were slightly below 0.700, the Composite Reliability (CR) values for all variables exceeded the threshold of 0.700. This demonstrates that the research instrument has good reliability and is consistent in measuring these variables.

Based on the model estimation results (Fig. 2), the standardized path coefficients now fall within the statistically acceptable range, ensuring the model's stability. A pivotal finding is the dual role of Public Services (Z), which acts as a potent moderator that significantly amplifies the impact of other inclusion dimensions on Well-being (Y). Specifically, public services significantly strengthen the influence of Education (X1) with a moderation coefficient of 1.000 (p = 0.000).

This statistically confirms that structural interventions, such as educational assistance and job training, are essential catalysts that ensure the benefits of education are optimally converted into community welfare.

Table 5: Validity and reliability

Variable	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Health (X2)	0.688	0.697	0.800	0.748
Wellbeing (Y)	0.639	0.675	0.786	0.784
Moderating effect 1	1.000	1.000	1.000	1.000
Moderating effect 2	1.000	1.000	1.000	1.000
Moderating effect 3	1.000	1.000	1.000	1.000
Public Service (Z)	0.638	0.756	0.772	0.706
Education (X1)	0.689	0.719	0.808	0.716
Economy (X3)	0.663	0.705	0.767	0.700

Furthermore, Public services (Z) strengthen the impact on health (X2) with a moderation coefficient of 1.141 and a significance of p = 0.000. The existence of health insurance such as JKMB eliminates access and financial barriers, maximizing the impact on health productivity. Meanwhile, public services (Z) strengthen the economic (X3) impact with a moderation coefficient of 1.186 and a significance of p = 0.000. This indicates that a concise and accessible public service system directly improves the economic resilience of the poor. These statistics confirm that even though inclusion levels are at the "Progressive" level, optimizing well-being is highly dependent on the quality of Public Services (Z). Public services not only have a direct impact but also act as a key catalyst (mediator and moderator) that multiplies the positive influence of education, health, and the economy on public well-being.

This model has an R^2 value of 0.664, indicating that the variables Education (X1), Health (X2), Economy (X3), and Public Service (Z) simultaneously explain 66.4% of the variance in Community Welfare (Y) in Medan City. Several other factors that influence the welfare of the people in Medan City and are not included in the model are environmental quality, infrastructure availability, demographics, socio-culture, and security and social order.

In addition to the findings on the vital role of public services, the novelty of this research lies in the methodological innovation that transforms the measurement of socio-economic inclusion from a simple descriptive approach into a measurable evaluative framework by dividing the level of inclusion into four systematic levels, namely Minimal, Partial, Progressive, and Optimal Social Inclusion. In contrast to previous studies that tend to

only describe the causes of poverty or focus on one dimension in isolation, this methodology offers a sharper assessment instrument to map the effectiveness of inclusion policies in urban areas holistically. The use of this four-level classification provides an original contribution to the public policy literature by providing a scientific basis for determining the status of progress in inclusive development of a region, which in the context of this research successfully identified the position of Medan City in the "Progressive" category.

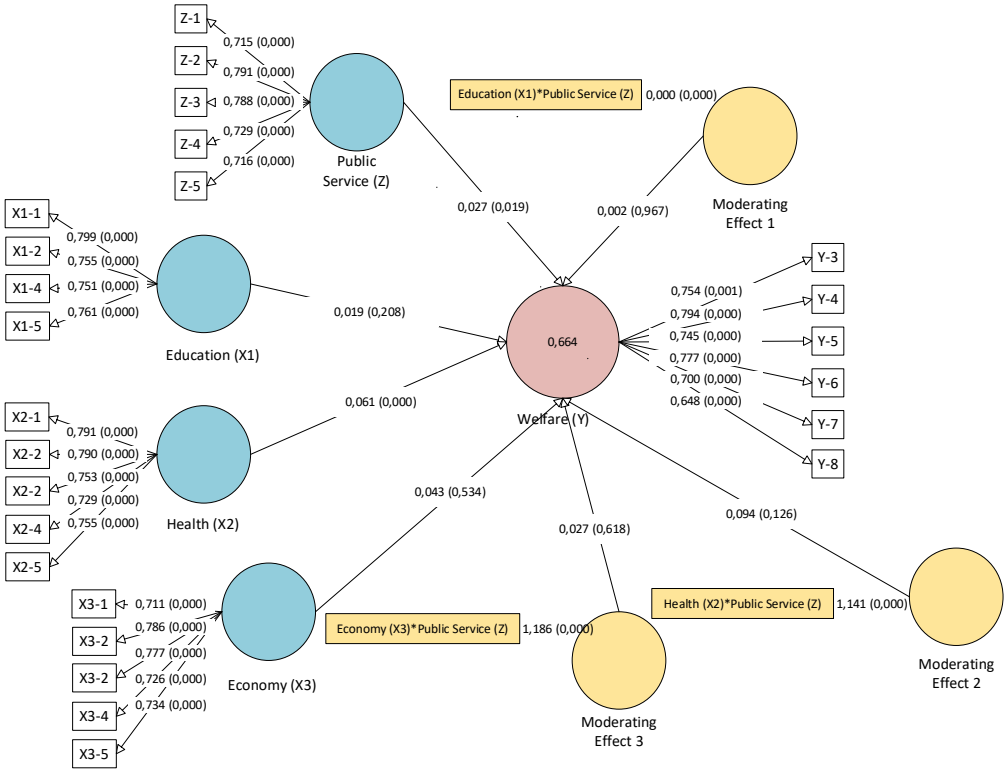

Fig. 2: Socio-economic inclusion model for well-being

This research is in conformity with the aims and ambitions of the United Nations Sustainable Development Goals (SDGs), specifically Goal 11, which aims at the establishment of inclusive and sustainable urban settlements. The socio-economic inclusion model developed in this context advocates for a harmonized and multisectoral approach encompassing the principles of urban inclusion as recognized and adopted worldwide (Souza et al., 2025).

4. Conclusion

This study successfully mapped the state of socioeconomic inclusion in the city of Medan using a multi-method approach. The main findings indicate that the level of socioeconomic inclusion in the city of Medan is at the “Progressive” level with a total score of 23.360. The results of the ANOVA test confirm a balance of performance among the four aspects studied, Public Services, Education, Health, and Economy, indicating no statistically significant difference in average scores ($p = 0.176$). Although there is a balance across sectors, the regression analysis reveals that Health (X2) is the most significant and robust single predictor of the well-being of the urban poor ($p = 0.004$), while the education and economic sectors show positive but statistically insignificant effects at the 95% confidence level. Furthermore, the SEM-PLS model confirms the crucial role of Public Services (Z) as a variable with dual capacity, namely as a mediator and moderator. Public services were found to significantly amplify the positive impact of the education, health, and economic sectors on community well-being, demonstrating that the effectiveness of inclusion is highly dependent on the quality and accessibility of the public service system.

Based on the research findings, policy efforts should primarily focus on strengthening the health sector by optimizing Universal Health Coverage (UHC), as these are the most significant predictors of well-being for the poor. Simultaneously, the government needs to align educational curricula with labor market needs, accelerate economic inclusion through expanded access to capital for MSMEs and financial literacy, and streamline public service bureaucracy, which has proven to serve as a vital moderator for multiplying the positive impact of all dimensions of inclusion on community well-being in a systemic and sustainable manner. This study has several limitations that should be taken into account when interpreting the results. First, regarding technical issues in SEM-PLS modeling, there were challenges in the stability of path coefficient estimates for moderation effects that approached or exceeded one due to the use of unstandardized product indicators in the initial

model. Although this issue was mitigated through an orthogonalization approach, it highlights the high complexity of simultaneously measuring latent variable interactions. Second, regarding generalizability, this study focuses specifically on the poor living in slum areas, riverbanks, and along railroad tracks in the city of Medan. This highly specific population focus limits the direct application of the findings to the context of urban poverty in other cities that may have different demographic, geographic, and local policy characteristics. Third, the use of a questionnaire as the primary data collection instrument creates the potential for self-report bias, where data on income, monthly expenditures, and participation in government programs are based entirely on respondents' memories and subjective perceptions, which may be influenced by social desirability bias. Future research is expected to combine primary data with objective administrative data and qualitative approaches to provide a more in-depth understanding of the effectiveness of inclusion policies in practice.

List of abbreviations

ANOVA	Analysis of variance
AVE	Average variance extracted
BPNT	Bantuan Pangan non-Tunai (non-cash food assistance)
CR	Composite reliability
H0	Null hypothesis
IDR	Indonesian Rupiah
JKMB	Jaminan Kesehatan Medan Berkah
MSMEs	Micro, small, and medium enterprises
PKH	Program Keluarga Harapan (family hope program)
PLS	Partial least squares
SDG	Sustainable development goal
SEM	Structural equation modeling
SEM-PLS	Structural equation modeling–partial least squares
Sig.	Significance
SPSS	Statistical package for the social sciences
UHC	Universal health coverage

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Compliance with ethical standards

Ethical considerations

This study, involving human participants, was conducted in accordance with ethical standards. Informed consent was obtained from all individual respondents prior to the administration of the survey questionnaires. Participants were informed about the purpose of the research, and they were assured that their participation was entirely voluntary, with the right to withdraw at any stage without consequence. To ensure privacy and confidentiality, all collected data were anonymized, and no personal identifying information was disclosed in this manuscript.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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