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HUMAN RESOURCE DEVELOPMENT AND COMPENSATION EFFECTS ON VILLAGE APPARATUS PERFORMANCE: EVIDENCE FROM EASTERN INDONESIA

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ABSTRACT

Purpose : This study examines the influence of Human Resource Development (HRD) and compensation on village apparatus performance to address persistent governance gaps in Indonesia's decentralized rural public administration system, with an empirical focus on Malaka Regency, East Nusa Tenggara Province.

Method/ Approach : A quantitative census design was employed to collect data from the entire population of 70 village officials in Manulea Village, Sasitamean District, Malaka Regency, during June–July 2025. Data were analyzed using multiple linear regression with robust assumption testing, supplemented by exploratory factor analysis and common method bias assessment.

Findings : The results confirm that both constructs are critical predictors. HRD significantly enhances performance (β = 0.64, p < .001, R^2 = .413), while compensation demonstrates a slightly stronger individual effect (β = 0.69, p < .001, R^2 = .475). In the simultaneous model, these predictors jointly explain 55.8% of the variance in performance (F (2, 67) = 42.22, p < .001). All effect sizes exceed Cohen's (1988) thresholds for large magnitude, confirming strong practical significance.

Limitations : The cross-sectional, single-district design limits causal inference and generalizability. Future research should employ longitudinal, multi-site designs incorporating objective performance indicators to explore boundary conditions across diverse Indonesian contexts.

Implications : The study recommends that local governments institutionalize mandatory HRD budget allocations (e.g., a minimum of 5% of village funds) and standardize comprehensive compensation packages. Crucially, this includes ensuring adequate work facilities such as computers, internet connectivity, and office infrastructure to enhance

the capacity of frontline public servants in delivering rural development programs.

Contribution : This study extends Human Capital Theory and Expectancy Theory to the resource-constrained context of village governance in an emerging market. It provides precise effect size estimates to guide evidence-based policy prioritization for Indonesia's 74,954 villages and contributes methodologically through rigorous measurement validation.

RESEARCH HIGHLIGHTS

- *HRD and compensation jointly explain 55.8% of village apparatus performance variance in rural Indonesia*
- *Compensation is stronger individual predictor (R^2 = .475) than HRD (R^2 = .413) in resource-poor contexts*
- *Validates Human Capital and Expectancy Theories in non-corporate village governance settings*
- *Provides evidence-based guidance for 127 villages in Malaka and 74,954 villages nationwide.*

Keywords: Human Resource Development, Compensation Systems, Village Apparatus Performance, Rural Governance, Human Capital Theory, Emerging Markets

JEL Classification: H70, J24, M12, M52, O15

1. INTRODUCTION

1.1. Establish Significance

The decentralization of governance in Indonesia, formalized through Law No. 32 of 2004 and further refined by Law No. 6 of 2014 on Villages (*Undang-Undang Republik Indonesia Nomor 6 Tahun 2014*), has fundamentally transformed the architecture of public administration by empowering 74,954 villages as autonomous legal entities responsible for managing local administration, development planning, and community welfare (Antlöv et al., 2016; World Bank, 2020). Within this framework, village apparatus comprising village heads, secretaries, section heads, and hamlet chiefs serve as frontline officials translating national development goals into tangible outcomes for approximately 43% of Indonesia's population residing in rural areas (BPS, 2024). Their performance directly determines the success of public service delivery, effective implementation of development programs funded through the Village Fund (*Dana Desa*), which has distributed over IDR 400 trillion since 2015, and ultimately, the socio-economic well-being of rural citizens (Ndun & Moeis, 2024).

High performance at this grassroots level is essential for accelerating infrastructure development, improving access to basic services, and building public trust critical factors for achieving Indonesia's Sustainable Development Goals by 2030 (Lewis, 2015; Sutiyo & Maharjan, 2017).

1.2. Research Problem and Gap

Despite this strategic importance, persistent performance deficits among village officials remain a critical governance challenge. National audit reports from the Supreme Audit Board (BPK) consistently reveal suboptimal budget absorption rates, incomplete development projects, and weak administrative capacity at the village level (Wargadinata & Sartika, 2019; Fetomalae et al., 2024). In Malaka Regency, East Nusa Tenggara Province a newly formed autonomous region established in 2012 poverty has declined from 17.20% (2017) to 13.92% (2024), yet Malaka remains among the province's least developed districts, with 127 villages facing severe governance capacity constraints (BPS Malaka, 2024; Sutikno, 2025). The 2026 national *Dana Desa* budget cuts totaling IDR 40 trillion further exacerbate challenges, with Malaka's villages receiving allocations ranging from IDR 256 million to IDR 556 million barely sufficient for administrative operations and basic infrastructure.

In Manulea Village, Sasitamean District the empirical focus of this study performance challenges are evidenced by incomplete infrastructure projects. Village planning data (2024) document that development programs including public sanitation facilities (*MCK umum*), farm-to-market roads, and clean water supply systems routinely achieve only 95–98% realization rates despite adequate budgetary provisions (Seran et al., 2021). This gap between planned objectives and realized outcomes undermines rural development effectiveness and perpetuates poverty cycles affecting agricultural communities.

While extensive scholarly attention examines employee performance in corporate settings through frameworks addressing motivation, competence, and organizational support (Salas et al., 2012; Aguinis & Kraiger, 2009), substantial gaps remain in understanding how these dynamics operate in resource-constrained village governance. Three critical gaps persist. First, most HRD performance studies examine Western corporate contexts with limited attention to non-corporate public administration in emerging markets (Garavan et al., 2012; Knies et al., 2018). Second, compensation research predominantly focuses on manufacturing and service sectors, neglecting village governance where non-financial compensation (facilities, equipment) may be equally critical (Syamsir, 2025). Third, integrated examinations combining HRD and compensation effects on village apparatus performance are scarce, particularly in severely resource-constrained border regions (Wargadinata & Sartika, 2019).

Empirical observations in Manulea Village underscore these gaps. Many village officials possess limited formal educational backgrounds predominantly high school diplomas (71.4% of apparatus) and lack access to regular, structured training programs. Only 39.3% attended professional development in 2024, including basic apparatus training (PAD), water management, and capacity building. Concurrently, compensation systems are critically insufficient: the village office inventory records only 1 computer, 3 laptops, 2 printers, 1 projector, 1 WiFi connection, and 1 motorcycle for 70 officials, physically constraining productivity and signaling organizational undervaluation of officials' contributions.

1.3. Study Overview and Contributions

This study addresses these gaps by quantitatively examining the individual and simultaneous influence of HRD and compensation on village apparatus performance in Manulea Village, Malaka Regency. Drawing on Human Capital Theory (Becker, 1964; Schultz, 1961) and

Expectancy Theory (Vroom, 1964), we propose that strategic investments in employee capabilities and welfare constitute fundamental prerequisites for effective grassroots governance. Using census data from all 70 village officials and employing multiple linear regression with robust measurement validation, this research (a) extends Human Capital and Expectancy Theories to under-researched village-level public administration in an emerging market border region, (b) provides precise effect size estimates enabling evidence-based policy prioritization, and (c) generates actionable recommendations scalable across Indonesia's 74,954 villages (Aqfir et al., 2025).

2. THEORETICAL BACKGROUND AND HYPOTHESES

2.1. Theoretical Framework

This study integrates Human Capital Theory (HCT) and Expectancy Theory within the broader Ability-Motivation-Opportunity (AMO) logic to explain village apparatus performance.

Human Capital Theory posits that the knowledge, skills, and abilities (KSAs) embodied in individuals are critical organizational assets that drive performance (Schultz, 1961; Becker, 1964). In the context of village governance, where officials face increasing bureaucratic complexity such as managing the *Dana Desa* and digital financial systems human capital becomes the primary determinant of organizational effectiveness. Contemporary perspectives emphasize that human capital is context-emergent; investments in education and training yield the highest returns when they align with specific task demands (Ployhart & Moliterno, 2011). Meta-analytic evidence further corroborates that systematic training programs produce substantial gains in job performance (Cohen's d = 0.62) by enhancing the cognitive capacity required for complex decision-making (Salas et al., 2012; Garavan et al., 2012).

Complementing the capability perspective, Expectancy Theory (Vroom, 1964) addresses the motivational mechanisms underlying performance. It proposes that an official's effort is a function of three cognitive perceptions: *expectancy* (effort leads to performance), *instrumentality* (performance leads to outcomes), and *valence* (outcomes are valued). In resource-constrained public sectors, compensation acts not merely as a financial transaction but as a critical signal of organizational support. When compensation and facilities are inadequate, the *expectancy* link is severed—officials may believe that effort is futile due to a lack of enabling resources—thereby diminishing performance (Gerhart & Fang, 2014; Shaw & Gupta, 2015).

Integrating these frameworks yields a dual-pathway model of performance. HRD functions as the "capacity-building" mechanism (enhancing the *ability* to perform), while compensation serves as the "motivation-enhancing" mechanism (increasing the *willingness* to exert effort). This synthesis suggests a synergistic relationship: high human capital is insufficient without the motivational pull of fair compensation, and motivation is ineffective without the requisite skills to execute tasks (Boxall & Purcell, 2011; Crook et al., 2011).

2.2. Construct Definitions

Human Resource Development (HRD). Defined as a process of developing and unleashing human expertise through organization development and personnel training and development for the purpose of improving performance (Swanson & Holton, 2009). In the specific context

of public sector reform, HRD is synonymous with "capacity building," focusing not only on technical skills but on the adaptive competencies required for governance. For village apparatus, this encompasses a spectrum of interventions: from foundational administrative training to advanced technical workshops on digital financial systems (e.g., *SISKEUDES*), participatory planning (*Musrenbang*), and regulatory compliance (Garavan et al., 2012; Lewis, 2015).

Compensation. Compensation refers to all forms of financial returns and tangible services and benefits employees receive as part of an employment relationship (Milkovich et al., 2014). This study adopts a "Total Rewards" perspective, which posits that compensation extends beyond monetary pay to include the physical work environment and enabling resources. In resource-constrained public administrations, non-financial dimensions specifically the availability of office infrastructure, digital tools, and a decent workspace are critical components of the compensation structure that signal organizational support and enable task execution (Gerhart & Fang, 2014; Syamsir, 2025).

Village Apparatus Performance. Public sector performance is a multidimensional construct reflecting the degree to which officials effectively execute administrative responsibilities to generate public value (Boyne, 2002; Moeheriono, 2012). It is operationalized here as the proficiency with which village officials meet formal job mandates under Law No. 6/2014. This includes task performance (quality, quantity, and timeliness of administrative outputs) and accountability (accuracy in financial reporting and service delivery standards) amidst the unique challenges of rural governance.

2.3. Hypothesis Development

2.3.1. Human Resource Development and Performance

Based on Human Capital Theory, HRD is not merely an expense but a strategic investment in the stock of knowledge, skills, and abilities (KSAs) that drives organizational productivity (Becker, 1964; Schultz, 1961). The mechanism is cognitive: training enhances an individual's capacity to process complex information and execute tasks efficiently. Meta-analytic evidence confirms that systematic training yields medium-to-large effects on job performance ($d = 0.62$) by bridging the gap between actual and required competencies (Salas et al., 2012; Garavan et al., 2012).

In the specific context of Manulea Village, the urgency of HRD is underscored by the competency gap: 71.4% of officials possess only a high school education, yet they face complex demands such as digital financial reporting (*SISKEUDES*) and regulatory compliance. With only 39.3% having received formal training, the lack of specific KSAs acts as a binding constraint on performance. Therefore, HRD interventions are expected to directly improve performance by equipping officials with the necessary technical and administrative capabilities (Knies et al., 2018; Blume et al., 2010).

H1: Human Resource Development (HRD) has a positive and significant effect on village apparatus performance.

2.3.2. Compensation and Performance

Drawing from Expectancy Theory (Vroom, 1964), compensation functions as a critical motivational mechanism. Performance is a function of the perceived link between effort and valued outcomes (*valence*). In the public sector, compensation extends beyond salary to include the physical work environment as a tangible signal of organizational support (Gerhart & Fang, 2014; Shaw & Gupta, 2015).

Recent empirical work in rural Indonesia (Syamsir, 2025) demonstrates that in resource-constrained settings, non-financial compensation specifically the availability of adequate facilities often outweighs monetary incentives. In Manulea Village, the severe scarcity of infrastructure (e.g., a ratio of one computer per 70 officials) creates a structural barrier to performance. Improving these conditions serves a dual function: it removes physical impediments to work (*enabling effect*) and boosts morale by satisfying officials' need for supportive working conditions (*motivational effect*). Thus, better compensation (including facilities) is hypothesized to significantly enhance performance.

H2: Compensation has a positive and significant effect on village apparatus performance.

2.3.3. Simultaneous Influence of HRD and Compensation

While HRD and compensation affect performance through distinct pathways capability enhancement and motivation, respectively integrated theoretical frameworks suggest they are complementary. Human Capital Theory postulates that the returns on skill investments are maximized only when employees are motivated to apply those skills (Becker, 1964; Crook et al., 2011). Conversely, Expectancy Theory implies that high motivation is futile if individuals lack the requisite competencies to perform (Vroom, 1964).

Ingraham (2005) argues that sustainable public sector performance requires a "bundled" approach, where capacity and motivation are addressed simultaneously. In the context of Manulea, providing training (HRD) without the tools to use it (Compensation/Facilities) would lead to frustration, while providing tools without the skills to use them would lead to inefficiency. Therefore, the simultaneous presence of both factors is expected to yield a robust and significant impact on performance, explaining a greater variance than either factor in isolation.

H3: Human Resource Development and compensation simultaneously have a positive and significant effect on village apparatus performance.

2.4. Conceptual Model

Figure 1 illustrates the conceptual framework guiding this study. Grounded in the integration of Human Capital Theory and Expectancy Theory, the model posits two primary antecedents of Village Apparatus Performance: Human Resource Development (HRD) and Compensation. HRD (X1) is hypothesized to enhance performance through capability building (H1), while Compensation (X2) operates through motivational and enabling mechanisms (H2).

To isolate the specific effects of these predictors, the model incorporates five demographic covariates: gender, age, education level, tenure, and position level (Garavan et al., 2012). The simultaneous influence of HRD and Compensation is expected to yield a synergistic effect (H3), explaining a substantial portion of the variance (R^2) in the endogenous construct.

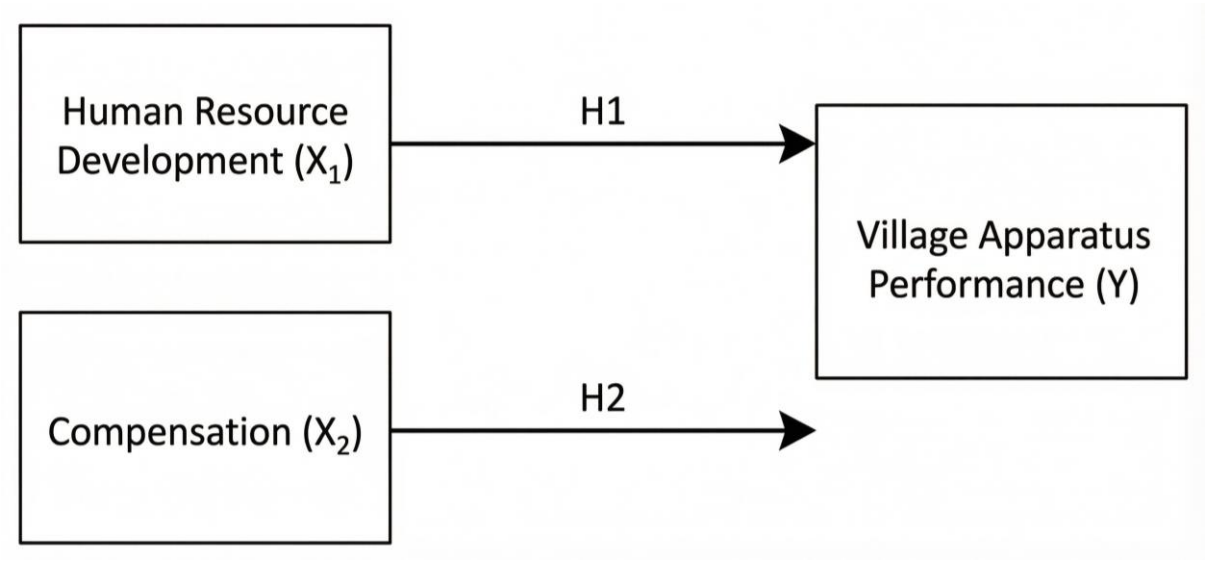

Figure 1. Conceptual Model of Human Resource Development and Compensation Effects on Village Apparatus Performance

Note. H1 = direct effect of Human Resource Development (X1) on Village Apparatus Performance (Y). H2 = direct effect of Compensation (X2) on Village Apparatus Performance (Y).

3. METHOD

3.1. Research Design and Context

A quantitative, cross-sectional survey design with an explanatory purpose was employed to examine the theory-driven hypotheses regarding the relationships between HRD, compensation, and performance (Creswell & Creswell, 2018). This design aligns with organizational behavior research frameworks aimed at strictly examining variable associations (Podsakoff et al., 2012).

The study was conducted in Manulea Village, Sasitamean District, Malaka Regency, East Nusa Tenggara, from June to July 2025. The site was selected based on four purposive criteria: (a) documented performance challenges, specifically the inability to achieve full completion targets (stagnating at 95–98% for key infrastructure); (b) severe resource constraints, characterized by minimal office facilities and low training participation; (c) socio-economic representativeness of Malaka's 127 villages within a newly autonomous border region with a 13.92% poverty rate (BPS Malaka, 2024; Sutikno, 2025); and (d) leadership willingness to support data collection (Seran et al., 2021).

3.2. Sample and Procedure

The study population comprised the entire cohort of 70 formally appointed village officials (including village heads, secretaries, section heads, hamlet chiefs, and administrative staff), explicitly excluding volunteer roles such as RT/RW. Given the manageable population size, a census (saturated sampling) method was employed (Tabachnick & Fidell, 2019).

To ensure statistical adequacy, an *a priori* power analysis was conducted using G*Power 3.1.9.7. Parameters were set for a medium effect size ($f^2 = 0.15$), an alpha level of $\alpha = .05$,

and a power of 1- β = .80 with two predictors. The analysis indicated a minimum required sample size of n = 68 (Faul et al., 2007). The final census sample (N = 70) exceeds this threshold and adheres to general guidelines suggesting 50–100 observations for regression models with few predictors (Hair et al., 2019).

Structured questionnaires were personally administered in June–July 2025 following ethics approval from University of Timor. Permissions were secured from district and village authorities, and all participants provided written informed consent. To mitigate Common Method Bias (CMB), procedural remedies included assuring respondent anonymity, separating predictor and outcome variables with filler items, randomizing item order, and using clear Bahasa Indonesia to reduce ambiguity (Podsakoff et al., 2012). This direct administration strategy resulted in the return of all 70 completed questionnaires, yielding a 100% response rate.

Table 1. *Demographic Characteristics of Respondents (N = 70)*

Characteristic	Category	n	%
Gender	Male	45	64.3
	Female	25	35.7
Age (M = 38.6, SD = 9.2)	20–29 years	12	17.1
	30–39 years	25	35.7
	40–49 years	22	31.4
	≥ 50 years	11	15.7
Education	High School (SMA/SMK)	50	71.4
	Diploma/Associate (D1–D3)	17	24.3
	Bachelor's Degree (S1)	3	4.3
Tenure in Position (M = 5.7, SD = 4.1)	1–3 years	20	28.6
	4–6 years	22	31.4
	7–10 years	18	25.7
	> 10 years	10	14.3
Position	Administrative Staff	40	57.1
	Hamlet Chief (Kepala Dusun)	20	28.6
	Section Head/Senior (Kasi)	10	14.3

Note. Percentages may not sum to exactly 100% due to rounding. Age and tenure statistics reported as mean (*M*) and standard deviation (*SD*). All 70 distributed questionnaires were returned complete (response rate = 100%).

3.3. Measures

All constructs were measured using validated scales adopted from established studies. To ensure linguistic and conceptual equivalence, the instruments followed Brislin's (1970) back-translation protocol. A panel of four experts reviewed the translation and back-translation processes, with discrepancies resolved via consensus. Responses were recorded on a seven-point Likert scale, ranging from 1 (*strongly disagree*/*never*) to 7 (*strongly agree*/*always*), depending on the item type.

Human Resource Development (HRD). Measured using six items adapted from Swanson and Holton (2009), the scale assessed training frequency, skill development, educational support, mentoring, and competency enhancement. The measurement model demonstrated robust internal consistency and validity ($\alpha = .89, CR = .90, AVE = .61$).

Compensation. This construct utilized eight items adapted from Milkovich et al. (2014), covering both financial and non-financial dimensions (e.g., salary adequacy, allowances, facilities, equipment, and work environment). The scale showed strong psychometric properties ($\alpha = .92, CR = .93, AVE = .63$).

Village Apparatus Performance. Performance was evaluated using nine items adapted from Moeheriono (2012) to capture work quality, quantity, timeliness, accuracy, and responsibility. The scale exhibited high reliability and validity ($\alpha = .94, CR = .95, AVE = .67$).

Control Variables. To account for potential confounding effects (Garavan et al., 2012), the study controlled for: gender (0 = female, 1 = male); age (in years); education (1 = high school, 2 = diploma, 3 = bachelor's); tenure (in years); and position level (1 = non-supervisory, 2 = hamlet chief, 3 = section head/senior).

3.4. Analytical Strategy

Data were analyzed using SPSS 26.0 (IBM). The analysis proceeded in four phases. Phase 1 involved preliminary analysis, including descriptive statistics, correlations, normality checks (skewness and kurtosis within ± 2), multicollinearity assessment (VIF < 3.0), and outlier detection (Hair et al., 2019). Phase 2 focused on measurement validation via Exploratory Factor Analysis (principal axis factoring with promax rotation), Cronbach's α, Composite Reliability (CR), Average Variance Extracted (AVE), and discriminant validity using the Fornell–Larcker criterion and HTMT ratios (Fornell & Larcker, 1981; Henseler et al., 2015). Phase 3 assessed Common Method Bias (CMB) using Harman's single-factor test and the Common Latent Factor (CLF) method with procedural remedies (Podsakoff et al., 2012). Finally, Phase 4 involved hypothesis testing via simple and multiple regression, interpreting effect sizes as small (R^2 = .02), medium (R^2= .13), and large (R^2 = .26) (Cohen, 1988).

4. RESULT

4.1. Descriptive Statistics and Correlations

Table 2 presents the descriptive statistics, reliability coefficients, and bivariate correlations. The participants reported moderate-to-high evaluations across all constructs. Performance (M = 5.12, SD = 0.97) received the highest rating, while Compensation (M = 3.87, SD = 1.34) was rated lowest, potentially reflecting the resource constraints and facility deficiencies noted in the study setting.

Bivariate correlations supported the theoretical expectations. HRD was positively and significantly correlated with Performance (r = .64, p < .001), and Compensation showed a strong positive association with Performance (r = .69, p < .001). Additionally, a moderate positive correlation was observed between HRD and Compensation (r = .52, p < .001). Multicollinearity was not a concern, as all Variance Inflation Factor (VIF) values were below the threshold of 2.0 (Hair et al., 2019).

Table 2. *Descriptive Statistics, Reliability, and Bivariate Correlations (N = 70)*

Variable	Mean (M)	SD	α	1	2	3
HRD (X1)	4.23	1.18	.89	(.78)		
Compensation (X2)	3.87	1.34	.92	.52***	(.79)	
Performance (Y)	5.12	0.97	.94	.64***	.69***	(.82)

Note. Diagonal values in parentheses represent $\sqrt{AVE}$ for each construct (Fornell & Larcker, 1981). HRD = Human Resource Development; X1 = HRD; X2 = Compensation; Y = Village Apparatus Performance. **p < .001 (two-tailed).

4.2. Measurement Validation and Common Method Bias Assessment

The measurement model was first assessed via Exploratory Factor Analysis (EFA). The results yielded a three-factor solution with eigenvalues greater than 1.0, explaining 68.4% of the total variance. Factor loadings ranged from .65 to .89 on the intended constructs, with no significant cross-loadings, thereby establishing initial construct validity (Hair et al., 2019).

Convergent validity and internal consistency were confirmed, as all constructs exhibited Cronbach's α values between .89 and .94, Composite Reliability (CR) ranging from .90 to .95, and Average Variance Extracted (AVE) values between .61 and .67 (Fornell & Larcker, 1981). Discriminant validity was assessed using two criteria. First, the Fornell–Larcker criterion was met, as the square root of the AVE for each construct (.78, .79, .82) exceeded the highest inter-construct correlation (.69). Second, the Heterotrait–Monotrait (HTMT) ratios ranged from .68 to .76, well below the conservative threshold of .85 (Henseler et al., 2015), providing robust evidence of discriminant validity.

To address potential Common Method Bias (CMB), Harman's single-factor test indicated that the largest unrotated factor explained 38.7% of the variance, below the 50% threshold. Furthermore, a Common Latent Factor (CLF) analysis showed that differences in standardized regression weights with and without the CLF were minimal (< .15). Combined with the procedural remedies described earlier, these results suggest that CMB is not a pervasive threat in this study (Podsakoff et al., 2012).

Table 3. *Measurement Model Summary: Reliability and Convergent Validity*

Construct	Items	Loadings	α	CR	AVE
Human Resource Development	HRD1–HRD6	.65–.84	.89	.90	.61
Compensation	COMP1–COMP8	.68–.87	.92	.93	.63
Performance	PERF1–PERF9	.71–.89	.94	.95	.67

Note. α == Cronbach's alpha; CR = composite reliability; AVE = average variance extracted. All values exceed recommended thresholds: α > .70, CR > .70, AVE > .50 (Hair et al., 2019). Factor loadings obtained from exploratory factor analysis with principal axis factoring and promax rotation (N = 70).

Table 4. *Fornell-Larcker Criterion*

Construct	1	2	3
HRD	(.78)		
Compensation	.52***	(.79)	
Performance	.64***	.69***	(.82)

Note. Diagonal values in parentheses represent $\sqrt{AVE}$ (Fornell & Larcker, 1981). **$p < .001$ (two-tailed).

Table 5. *HTMT Ratios*

Construct	1	2	3
HRD	—		
Compensation	.68	—	
Performance	.73	.76	—

Note. All HTMT ratios < .85 conservative threshold (Henseler et al., 2015), confirming discriminant validity.

4.3. Hypothesis Testing

The regression analysis results, summarized in Table 5, confirm all proposed hypotheses. First, Human Resource Development (HRD) demonstrated a significant positive effect on Performance (β = .64, t (68) = 6.91, p < .001), with an R^2 of .413, supporting H1. Second, Compensation also showed a strong positive influence on Performance (β = .69, t (68) = 7.84, p < .001), explaining 47.5% of the variance (R^2 = .475) and supporting H2.

When tested simultaneously (H3), the model remained highly significant (F (2, 67) = 42.22, p < .001). The combination of HRD and Compensation explained 55.8% of the variance in Village Apparatus Performance (R^2 = .558). In this multiple regression model, Compensation emerged as the dominant predictor (β = .48, p < .001) compared to HRD (β = .35, p < .001), although both remained statistically significant. These effect sizes substantially exceed Cohen's (1988) threshold for large effects.

Table 6. *Regression Results and Hypothesis Testing Summary*

Hypothesis	Path	Std. β	t-value	p-value	R^2 / Result
H1	HRD → Performance	.64	6.91	< .001	.413 (Supported)
H2	Comp → Performance	.69	7.84	< .001	.475 (Supported)
H3	Combined Model			< .001	.558 (Supported)
	HRD (in H3)	.35	3.52	< .001	
	Comp (in H3)	.48	4.85	< .001	

Note. Standardized regression coefficients (β) reported. H1 and H2 tested via simple linear regression; H3 tested via simultaneous multiple regression. Effect size interpretation: $R^2 > .26$ = large (Cohen, 1988). All VIF values < 2.0, confirming no multicollinearity. ***p < .001.

4.4. Robustness Checks

To ensure the stability of the results, a series of robustness checks were conducted. First, influence diagnostics via Cook's distance revealed no influential outliers; sensitivity analyses excluding potential high-leverage cases yielded consistent conclusions. Second, the assumption of linearity was confirmed, as the inclusion of quadratic terms proved non-significant ($p > .10$). Third, the Breusch–Pagan test indicated the presence of homoscedasticity, and residual analysis confirmed an approximation to normality (skewness and kurtosis within ± 2). Finally, controlling for demographic covariates (gender, age, education, tenure, position) resulted in negligible shifts in the primary coefficients ($\Delta \beta < .03$), demonstrating that the main findings remain robust across model specifications (Tabachnick & Fidell, 2019; Hair et al., 2019).

5. DISCUSSION

5.1. Summary of Findings and Theoretical Contributions

The study provides empirical evidence that Human Resource Development (HRD) and compensation are critical determinants of village apparatus performance, even within the resource-constrained context of a border regency. Consistent with human capital theory (Salas et al., 2012; Garavan et al., 2012), HRD emerged as a significant predictor, suggesting that competence-building interventions directly translate into improved bureaucratic output. Notably, compensation exhibited a slightly stronger individual effect than HRD. This finding aligns with Expectancy Theory, implying that in a setting characterized by limited infrastructure, tangible rewards and facility improvements serve as powerful "hygiene factors" and motivators that are prerequisites for high performance (Gerhart & Fang, 2014; Syamsir, 2025).

Theoretically, these findings extend the boundary conditions of Human Capital and Expectancy Theories traditionally grounded in corporate, resource-rich settings to the distinct context of public administration in an emerging market border region. The results illustrate that capability and motivation mechanisms remain robust even under severe resource scarcity. Furthermore, the synergistic effect observed in the combined model supports an integrated framework: capability-building (HRD) and motivation-enhancing (compensation) interventions function as complementary rather than substitutable forces. Neglecting one diminishes the efficacy of the other (Perry et al., 2010; Crook et al., 2011).

5.2. Practical Implications

Four actionable implications emerge for policy and practice. First, district governments should institutionalize a specific regulatory framework mandate, such as earmarking a minimum 5% of the Village Fund (*Dana Desa*) specifically for HRD. This allocation should fund critical competency training including financial management applications (*SISKEUDES*),

participatory planning (*Musrenbang*), and regulatory compliance as well as scholarship programs for village officials seeking higher education.

Second, regarding compensation and facilities, national and district authorities must define Minimum Service Standards (SPM) for village office infrastructure. Given the strong correlation between tangible resources and performance in deprived settings, standards should ensure adequate digital tools (e.g., a target ratio of one computer per five officials) and reliable internet access to support administrative duties.

Third, policy design must shift from fragmented interventions to a holistic approach. The findings demonstrate that simultaneous investments in HRD and compensation yield synergistic returns that exceed the sum of individual interventions. Finally, strategic priority should be accorded to border and least-developed regions like Malaka. In these areas, the marginal utility of human resource investments is highest, offering the greatest potential for accelerating bureaucratic reform (Lewis, 2015; Sutikno, 2025).

5.3. Limitations and Future Research Directions

Several limitations warrant consideration when interpreting these findings. First, the cross-sectional design precludes the definitive establishment of causal inferences. Future scholarship should employ longitudinal or quasi-experimental approaches to rigorously track how HRD interventions impact performance over time (Podsakoff et al., 2012).

Second, while the census method ensured high internal validity, the study's focus on a single administrative locus restricts external validity. Future research should expand to multi-site studies across Malaka's 127 villages or other border provinces to test boundary conditions and generalizability (Creswell & Creswell, 2018).

Third, reliance on self-reported measures may introduce response bias, despite the procedural controls for Common Method Variance (CMV). To enhance robustness, future studies should integrate objective performance metrics, such as budget realization rates (*SISKEUDES* logs) and administrative audit scores.

Finally, to refine the theoretical framework, future models should examine psychological mediators (e.g., public service motivation, self-efficacy) and contextual moderators specific to the region (e.g., leadership style, poverty levels, and proximity to cross-border checkpoints) (Perry et al., 2010; Knies et al., 2018).

6. CONCLUSION

This This study establishes that Human Resource Development (HRD) and compensation are decisive determinants of village apparatus performance in the border region of Malaka Regency. The findings reveal that HRD investments are critical for enhancing officials' capability to navigate complex administrative demands, while compensation particularly physical work facilities serves as a fundamental motivational enabler. The substantial combined effect of these variables underscores that capability-building and motivation-enhancing mechanisms must work in tandem to achieve optimal bureaucratic output.

Theoretically, the research extends the applicability of Human Capital and Expectancy Theories beyond their traditional corporate boundaries to the resource-constrained context of rural public administration. Practically, it offers an evidence-based framework for district

governments to prioritize specific HRD budgetary allocations and standardize compensation infrastructure. Ultimately, the study argues that strategic investment in the capacity and well-being of frontline officials is a prerequisite for realizing Indonesia's ambitious rural development and decentralized governance goals (Lewis, 2015; Sutiyo & Maharjan, 2017; World Bank, 2020).

DECLARATIONS

Author Contributions

Sabina Paulina Luji Fernandes: Conceptualization (lead), Methodology (lead), Formal analysis (lead), Investigation (lead), Data curation (lead), Writing – original draft (lead), Writing – review & editing (equal), Project administration (lead).
Yesus Armiro Korbaffo: Investigation (supporting), Data curation (supporting), Formal analysis (supporting), Writing – review & editing (supporting), Validation (supporting).

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Data Availability

The dataset generated and analyzed during the current study is not publicly available due to ethical restrictions imposed by the University of Timor research ethics committee, sensitive organizational data from Manulea Village government protected by formal permissions, and participant privacy protections that preclude sharing even anonymized records. However, aggregated summary statistics, correlation matrices, and analysis syntax are available from the corresponding author on reasonable request and may be shared subject to institutional approval and data use agreements.

Conflict of Interest

The authors declare no conflicts of interest related to this research. No financial or personal relationships influenced research design, data collection, analysis, interpretation, or manuscript preparation.

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The authors declare that generative AI or AI-assisted technologies were not used in preparing, writing, or completing this manuscript. The authors are the sole creators of this article and accept full responsibility for content, as outlined in COPE guidelines.

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