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Financial and Non-Financial Incentive Mechanisms in ISPO Certification: A Management Control Systems Perspective

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ABSTRACT

Sustainability certification has become a key governance instrument for aligning dispersed actors with environmental and regulatory objectives, particularly in agricultural value chains. However, the effectiveness of incentive mechanisms designed to support certification adoption remains insufficiently understood, especially when different types of incentives are evaluated within an integrated framework. Drawing on a management control systems (MCS) perspective, this study examines the comparative effects of financial, non-financial, and combination incentives on independent smallholders' perceived effectiveness of support for Indonesian Sustainable Palm Oil (ISPO) certification. This study adopts a quantitative explanatory approach using survey data collected from 143 oil palm smallholders in South Kalimantan, Indonesia. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the relationships between incentive mechanisms and perceived effectiveness. The findings reveal that all three types of incentives have a positive and statistically significant influence. However, non-financial incentives demonstrate the strongest effect ($\beta = 0.352$, $p < 0.001$), followed by financial incentives ($\beta = 0.261$, $p < 0.001$), while combination incentives show a weaker effect ($\beta = 0.165$, $p < 0.05$). These results suggest that enabling controls, such as training, market access facilitation, and institutional recognition, play a more critical role than outcome-based financial incentives in shaping perceived effectiveness. Furthermore, the findings challenge the assumption of automatic complementarity in combined incentive designs, indicating that integration does not necessarily enhance effectiveness in fragmented institutional contexts. This study contributes to management accounting literature by extending the concept of control packages to extra-organizational sustainability governance and highlights the conditional nature of incentive complementarity. The findings offer important implications for designing more coherent and effective sustainability-oriented policy interventions in developing economies.

1. Introduction

Sustainability certification has emerged as a significant governance instrument in global agricultural value chains, particularly in sectors associated with environmental concerns (Tedesco et al., 2023). In management accounting scholarship, such certification schemes represent an underexplored context for understanding how control mechanisms operate beyond organizational boundaries (Merchant & Otley, 2020). When governments mandate compliance with sustainability standards, they face a fundamental challenge: how to align the behavior of dispersed actors with regulatory objectives in the absence of hierarchical authority (Johnstone, 2022).

Incentive systems, in this context, function as policy instruments designed to reduce resistance, compensate compliance costs, and encourage behavioral alignment (Malmi & Brown, 2008). The application of management control concepts in Southeast Asian governance contexts has also gained increasing attention, particularly in understanding how regulatory mechanisms shape behavior in diverse institutional settings, particularly in contexts characterized by policy complexity and implementation challenges (Anshari et al., 2025).

The Indonesian Sustainable Palm Oil (ISPO) certification scheme provides a relevant empirical setting to examine these dynamics. Introduced in 2011 as a mandatory instrument to strengthen environmental governance and production sustainability, ISPO represents Indonesia's primary regulatory response to global scrutiny over palm oil's environmental footprint (Denashurya et al., 2023). As the world's largest palm oil producer, Indonesia's ability to implement sustainable production standards carries implications for both environmental outcomes and international market access (Putri et al., 2022).

Despite its regulatory intent, ISPO adoption among independent smallholders remains persistently low (Watts et al., 2021). This implementation gap is particularly consequential given that smallholders cultivate over 40% of Indonesia's oil palm area (Supriatna et al., 2024). Independent farmers, those operating outside corporate partnership structures, face substantial barriers to certification, including limited technical capacity, constrained financial resources, and weak institutional support (Siregar et al., 2024). Compliance requires fulfilling complex environmental, administrative, and legal requirements that are often perceived as costly and bureaucratic (Tedesco et al., 2023).

In response to these barriers, policymakers have introduced various incentive mechanisms to facilitate certification adoption. Three categories are commonly distinguished. Financial incentives include input subsidies, price premiums, and replanting funds designed to reduce entry costs and compensate compliance expenses (Wibowo et al., 2023). Non-financial incentives encompass technical training, market access facilitation, and government recognition, mechanisms aimed at enhancing farmer capability, knowledge, and legitimacy (Attallah et al., 2022). Combination incentives integrate both approaches, reflecting the common policy assumption that financial and non-financial supports generate synergistic effects when deployed together (Li et al., 2021; Tedesco et al., 2023).

From a management control systems perspective, these mechanisms can be conceptualized as components of sustainability-oriented control systems operating beyond organizational boundaries (Johnstone, 2022). Financial incentives function primarily as outcome-based controls, rewarding predefined performance outcomes (Tessier & Otley, 2012). Non-financial incentives correspond to enabling controls, which support actors by enhancing competence, facilitating problem-solving, and strengthening intrinsic motivation (Adler & Borys, 1996). This distinction has important implications for policy design, as enabling controls address underlying capability and legitimacy constraints, rather than merely compensating for compliance costs (Adler & Borys, 1996), particularly in governance contexts characterized by implementation complexity (Anshari et al., 2025).

However, the relationship between these mechanisms is theoretically ambiguous. While policy discourse often assumes that combining financial and non-financial incentives generates synergistic effects, management control literature suggests that complementarity among control mechanisms is conditional and depends on coherence and implementation context. This creates a theoretical tension between the assumption of automatic synergy in integrated incentive designs and the possibility that fragmentation in implementation may weaken their perceived effectiveness.

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Despite the proliferation of incentive-based support mechanisms, existing research on sustainability certification has predominantly examined incentives in isolation (e.g., Pramudya et al., 2022; Wibowo et al., 2023). Studies that consider the comparative effectiveness of different incentive types remain limited, particularly from the perspective of smallholders who experience these mechanisms directly. From a management control standpoint, this gap is more fundamental. Prior research has not sufficiently examined how outcome-based and enabling controls are interpreted by actors operating outside formal organizational hierarchies. This omission is consequential because control effectiveness depends not only on formal design but also on how mechanisms are perceived and experienced by their intended targets (Hall, 2016; Merchant & Otley, 2020).

This study addresses these gaps by examining how financial, non-financial, and combination incentives influence independent smallholders' perceived effectiveness of support for ISPO adoption. Specifically, it tests three hypotheses: that financial incentives positively influence perceived effectiveness, that non-financial incentives positively influence perceived effectiveness, and that combination incentives positively influence perceived effectiveness.

This study makes three contributions. First, it provides empirical evidence on the comparative perceived effectiveness of distinct incentive types in a mandatory certification context, addressing a gap where incentives are typically analyzed in isolation. Second, it extends management control systems literature by examining how outcome-based and enabling controls operate in an extra-organizational sustainability governance context. Third, it challenges the commonly assumed complementarity of combined incentives by showing that integrated mechanisms may not necessarily produce stronger perceived outcomes, particularly in contexts characterized by institutional fragmentation.

2. Literature Review and Hypotheses Development

2.1 Conceptual and Theoretical Foundations

2.1.1 Incentives in Management Control Systems: A Policy Perspective

In management accounting literature, incentive controls are recognized as central elements of management control systems (MCS) designed to align individual behavior with organizational or regulatory objectives (Malmi & Brown, 2008; Merchant & Otley, 2020). When governments mandate sustainability compliance, they face a distinctive challenge: influencing dispersed actors operating outside formal hierarchies (Johnstone, 2022). In such contexts, incentives function as policy instruments that reduce resistance, compensate compliance costs, and encourage behavioral alignment.

Two theoretical perspectives provide competing explanations of incentive effectiveness. Agency theory emphasizes extrinsic rewards as mechanisms to align self-interested actors with regulatory goals (Eisenhardt, 1989). In contrast, stewardship theory suggests that actors may be intrinsically motivated when they identify with broader goals, implying that external rewards are not always necessary (Davis et al., 1997). This tension highlights that incentive effectiveness depends not only on economic calculus but also on motivational mechanisms and contextual factors.

A related distinction is Adler & Borys's (1996) typology of coercive versus enabling controls. Coercive controls enforce compliance through monitoring and rules, often generating resistance, whereas enabling controls enhance competence, facilitate problem-solving, and strengthen intrinsic motivation. Recent research in Southeast Asian governance contexts reinforces that control effectiveness depends critically on how mechanisms are perceived and internalized by target actors, particularly through trust and legitimacy in governance processes (Ahmad et al., 2024).

Within sustainability certification, incentive mechanisms can be conceptualized as

components of control packages (Malmi & Brown, 2008). Financial incentives function primarily as outcome-based controls (Tessier & Otley, 2012), while non-financial incentives operate as enabling controls. Their effectiveness depends on coherence and how they are experienced by actors (Merchant & Otley, 2020). This perspective shifts the policy question from what incentives to offer to how different controls interact and are perceived within a broader system.

2.1.2 Financial Incentives: Effectiveness and Limitations

Financial incentives are the most widely used mechanisms in sustainability certification programs. In the palm oil sector, they include input subsidies, price premiums, and replanting funds aimed at reducing compliance costs (Wibowo et al., 2023). Their underlying logic is straightforward: lowering economic barriers increases adoption likelihood (Pramudya et al., 2022).

Synthesizing prior research reveals a dual pattern. On the one hand, financial incentives consistently support initial adoption. Access to subsidies and replanting funds has been shown to increase willingness to pursue certification (Pramudya et al., 2022), and institutionalized incentives can accelerate uptake (Wibowo et al., 2023). In Indonesia, substantial public resources allocated through BPDPKS reflect policy confidence in these mechanisms (Siregar et al., 2024).

On the other hand, their influence on sustained compliance remains contested. Motivation crowding theory suggests that extrinsic rewards may undermine intrinsic motivation (Li et al., 2021; Ling & Xu, 2021). Farmers motivated primarily by financial gain may discontinue sustainable practices once incentives are removed (Attallah et al., 2022). Moreover, financial incentives do not address knowledge gaps or administrative complexity inherent in certification processes (Watts et al., 2021).

These limitations are particularly salient in the ISPO context, where compliance requires not only financial investment but also procedural knowledge and administrative capability (Supriatna et al., 2024). Thus, while financial incentives are necessary, they may be insufficient as standalone mechanisms.

2.1.3 Non-Financial Incentives as Enabling Controls

Non-financial incentives operate through fundamentally different mechanisms. Rather than compensating costs, they enhance capability, knowledge, and legitimacy (Adler & Borys, 1996). In the ISPO context, three mechanisms are particularly relevant.

Technical training reduces information asymmetry and builds self-efficacy, enabling farmers to meet certification requirements (Attallah et al., 2022; Ryan & Deci, 2020; Watts et al., 2021). Market access facilitation increases perceived value by linking certification to tangible economic opportunities, strengthening outcome expectancy (Attallah et al., 2022). Government recognition enhances legitimacy and supports internalization of sustainability practices as socially valued behavior (Ling & Xu, 2021; Malmi & Brown, 2008).

Across contexts, evidence consistently shows that non-financial incentives are effective in promoting sustained behavioral change. Non-monetary mechanisms influence environmental attitudes more strongly than financial rewards (Attallah et al., 2022), particularly when they foster intrinsic motivation (Ryan & Deci, 2020). In developing economies, enabling controls addressing capability and legitimacy are especially salient where institutional trust is limited (Ahmad et al., 2024).

In the Indonesian smallholder context, where compliance requires both technical knowledge and administrative capability (Supriatna et al., 2024), non-financial incentives directly address core barriers to certification.

2.1.4 Combination Incentives: Complementarity and the Risk of Fragmentation

Combining financial and non-financial incentives represents a dominant policy

approach in sustainability governance. The underlying assumption is that financial support reduces entry barriers, while non-financial support builds long-term capability, producing complementary effects (Tedesco et al., 2023). This logic has informed integrated programs in Indonesia, where farmers may receive subsidies alongside training and certification assistance (Wibowo et al., 2023).

From a theoretical perspective, complementarity suggests that control mechanisms can reinforce one another when they address different dimensions of a problem (Grabner & Moers, 2013). However, this assumption is not unconditional. Complementarity depends on coherence, coordination, and how mechanisms are experienced by actors.

Management control literature highlights potential tensions within control packages. Interactions among multiple controls may create conflicting demands or reduce effectiveness when poorly coordinated (Brown & Malmi, 2024). Established systems may also constrain integration and generate unintended consequences (Dimes & de Villiers, 2021).

In policy implementation, several contingencies may weaken synergistic effects. Institutional fragmentation can result in disjointed delivery across agencies, reducing perceived coherence. Administrative burden may offset benefits when farmers must navigate multiple programs (Li et al., 2021). Prior experiences with inconsistent programs may also shape skepticism (Grabner & Moers, 2013).

These considerations point to a potential "combination effect paradox", where integrated incentives, despite their theoretical complementarity, may not produce stronger perceived effectiveness under conditions of fragmentation and coordination challenges.

While complementarity theory predicts a positive relationship, these contingencies suggest that the effect of combination incentives is conditional on implementation coherence. Consistent with the dominant policy logic, this study tests the baseline complementarity prediction in H3, while recognizing that its magnitude may vary across contexts.

2.1.5 Institutional Context and Perceived Support

The effectiveness of incentive mechanisms depends on the institutional context in which they are implemented. Indonesia's palm oil governance involves multiple actors, including central government agencies, BPDPKS, regional offices, and private sector stakeholders (Putri et al., 2022). This multi-actor structure creates both opportunities for synergy and risks of fragmentation.

When coordination is effective, farmers may experience support as coherent and accessible. However, when institutions operate with limited alignment, farmers may encounter inconsistent procedures and fragmented interventions (Watts et al., 2021). This gap between policy design and implementation highlights the importance of perceived support.

In such contexts, effectiveness depends not only on the availability of incentives but also on how accessible, coherent, and trustworthy they are perceived to be. This reinforces the relevance of examining incentive mechanisms through the lens of perceived effectiveness rather than formal program design alone.

2.2. Review of Empirical Studies

Recent empirical studies reveal consistent yet nuanced findings regarding the effectiveness of incentive mechanisms in sustainability governance. Financial incentives have been widely documented as effective drivers of initial adoption, particularly in reducing economic barriers and increasing participation in certification programs (Pramudya et al., 2022; Wibowo et al., 2023). However, several studies highlight their limitations in sustaining long-term behavioral change, as reliance on monetary rewards may weaken intrinsic motivation and lead to discontinuation once incentives are withdrawn (Li et al., 2021; Ling & Xu, 2021; Attallah et al., 2022).

In contrast, non-financial incentives demonstrate stronger and more consistent effects on sustained compliance. Empirical evidence shows that training, knowledge transfer, and institutional support significantly enhance farmers' capabilities and foster internalization of sustainability practices (Watts et al., 2021; Attallah et al., 2022). Moreover, non-monetary incentives are found to be more effective in shaping environmental attitudes and long-term commitment, particularly when they strengthen intrinsic motivation and perceived legitimacy (Ryan & Deci, 2020; Ahmad et al., 2024).

Studies examining combined incentive mechanisms provide mixed results. While some research supports the complementarity perspective, suggesting that integrated incentives produce stronger outcomes (Tedesco et al., 2023), other studies identify challenges related to coordination, administrative complexity, and institutional fragmentation (Li et al., 2021; Grabner & Moers, 2013). These inconsistencies indicate that the effectiveness of combined incentives is highly contingent on implementation quality and governance context.

Methodologically, prior studies are dominated by single-mechanism analyses and often lack comparative frameworks that simultaneously evaluate multiple incentive types. In addition, many studies focus on specific outcomes, such as adoption rates, without adequately capturing perceived effectiveness from the perspective of target actors. These limitations highlight the need for a more integrative and perception-based approach.

2.3 Identification of Research Gap

The literature reveals several important patterns. First, financial incentives are effective for initial adoption but limited in sustaining long-term compliance due to potential crowding-out effects (Li et al., 2021; Ling & Xu, 2021; Pramudya et al., 2022; Wibowo et al., 2023). Second, non-financial incentives consistently support intrinsic motivation and capability development, making them critical for sustained behavioral change (Attallah et al., 2022; Ryan & Deci, 2020). Third, combination incentives are theoretically appealing but empirically uncertain, as their effectiveness depends on coherence and implementation quality (Brown & Malmi, 2024; Grabner & Moers, 2013).

Despite these insights, three gaps remain. First, prior studies predominantly examine incentives in isolation, with limited comparative analysis. Second, empirical evidence on how different incentive types are perceived within a unified framework remains scarce. Third, management control research has yet to fully examine how outcome-based and enabling controls operate in extra-organizational sustainability governance contexts (Johnstone, 2022; Merchant & Otley, 2020).

Collectively, these gaps indicate the need for a comparative and theoretically grounded examination of incentive mechanisms within a unified analytical framework. Addressing these gaps is important not only for advancing management accounting theory on control packages, but also for informing more effective incentive design in sustainability governance.

2.4 Development of the Conceptual Framework

This study develops a conceptual framework that integrates three types of incentive mechanisms—financial, non-financial, and combination incentives—as independent variables influencing the perceived effectiveness of support for ISPO adoption.

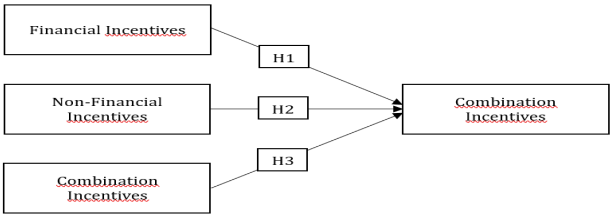

Fig. 1. Conceptual Framework of the Study

2.5 Hypotheses Development

Based on the theories and conceptual framework described above, the research hypotheses can be formulated as follows:

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H1: Financial incentives positively influence perceived effectiveness of support for ISPO adoption.

H2: Non-financial incentives positively influence perceived effectiveness of support for ISPO adoption.

H3: Combination incentives positively influence perceived effectiveness of support for ISPO adoption.

3. Research Methods

3.1 Research Design

This study adopts a quantitative explanatory design to examine the relative influence of financial, non-financial, and combination incentives on smallholders' perceived effectiveness of support for ISPO adoption. This approach is appropriate as the study aims to test theoretically derived hypotheses and assess structural relationships among latent constructs (Hair et al., 2019).

Partial Least Squares Structural Equation Modeling (PLS-SEM) was selected over covariance-based SEM (CB-SEM) for three reasons. First, the study emphasizes prediction and explanation of variance in the target construct (perceived effectiveness), aligning with the predictive orientation of PLS-SEM (Hair et al., 2019). Second, the model includes multiple latent constructs with a relatively modest sample size (N = 143), where PLS-SEM provides robust estimation without strict distributional assumptions. Third, the study examines theoretically grounded relationships in a relatively underexplored empirical context, making PLS-SEM suitable due to its flexibility in handling exploratory extensions of theory (Hair et al., 2019).

3.2 Research Context and Setting

The empirical context is the Indonesian Sustainable Palm Oil (ISPO) certification scheme in South Kalimantan Province, Indonesia. The province is characterized by substantial smallholder oil palm cultivation and relatively low certification rates (Putri et al., 2022).

Independent smallholders, farmers operating outside corporate structures, constitute the target population, as they are subject to regulatory controls without organizational mediation (Merchant & Otley, 2020). Although ISPO certification is formally mandatory, enforcement among independent smallholders remains limited due to institutional constraints and monitoring challenges (Watts et al., 2021). As a result, adoption decisions are effectively discretionary, making perceived effectiveness of support a relevant explanatory construct.

3.3 Population and Sample

The population comprises independent oil palm smallholders in South Kalimantan. Based on provincial agricultural data, total smallholder cultivation across seven districts is approximately 159,984 hectares. Assuming an average holding size of 3.5 hectares, the estimated population is approximately 12,847 farmers.

Purposive sampling was employed to ensure respondents met the study criteria: (1) managing at least two hectares of oil palm plantation, (2) not yet ISPO certified, and (3) registered with farmer groups to ensure accessibility and reliable contact information. Respondents were identified through district agricultural offices and farmer group networks across seven districts.

This approach yielded 143 valid responses. A priori power analysis using G*Power 3.1 (Faul et al., 2009), assuming three predictors, medium effect size ($f^2 = 0.15$), $\alpha = 0.05$, and power = 0.80, indicated a minimum sample size of 77. The achieved sample size exceeds this threshold, indicating sufficient statistical power.

Respondent characteristics include a mean age of 44.3 years (SD = 11.2) and average farming experience of 11.7 years (SD = 8.4). Approximately 62.2% are farmer group members, and 30.1% have prior sustainability training. Educational attainment is relatively modest, consistent with regional smallholder profiles.

3.4 Data Sources and Data Collection

Primary data were collected through a structured questionnaire administered between April and June 2025. A mixed-mode approach was employed, combining face-to-face interviews (68.5%) and online distribution via farmer group networks (31.5%). Face-to-face administration was used to ensure inclusivity for respondents with limited literacy and to allow clarification of questions, thereby improving data quality.

The questionnaire comprised three sections: demographic information, perceptions of incentive mechanisms, and perceived effectiveness of support. All items were measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Content validity was established through expert review involving two management accounting academics and one ISPO practitioner. Pilot testing with 15 smallholders was conducted to assess clarity and contextual relevance, resulting in minor refinements to item wording.

3.5 Measurement of Variables and Research Instuments

All constructs were operationalized reflectively, as the indicators are assumed to represent manifestations of the underlying latent constructs rather than defining them (Coltman et al., 2008).

Financial incentives (3 items) were adapted from (Pramudya et al., 2022; Wibowo et al., 2023). Non-financial incentives (3 items) were adapted from Attallah et al. (2022). Combination incentives (2 items) were developed based on complementarity literature (Grabner & Moers, 2013). Perceived effectiveness (6 items) was adapted from Denashurya et al. (2023), Pramudya et al. (2022), and Wibowo et al. (2023).

Indicators with outer loadings below recommended thresholds were evaluated and removed iteratively to improve convergent validity, following established PLS-SEM procedures (Hair et al., 2019).

The Average Variance Extracted (AVE) for perceived effectiveness was 0.43, slightly below the recommended threshold of 0.50. However, convergent validity was deemed acceptable because composite reliability exceeded 0.70 (CR = 0.81) and most indicator loadings were above 0.70. This approach is consistent with Fornell and Larcker (1981) and prior PLS-SEM research in exploratory contexts (Hair et al., 2019).

3.6 Data Analysis Techniques

Data were analyzed using SmartPLS 4 following a two-stage approach (Hair et al., 2019). The first stage assessed the measurement model, and the second stage evaluated the structural model. Measurement model assessment included indicator reliability (outer loadings), internal consistency (composite reliability), convergent validity (AVE), and discriminant validity using the Fornell-Larcker criterion and HTMT ratio (Henseler et al., 2015).

Structural model assessment included path coefficients, t-statistics, and p-values obtained through bootstrapping (5,000 resamples), as well as explanatory power (R^2), predictive relevance (Q^2), and effect sizes (f^2). Common method bias was assessed using two complementary approaches. Harman's single-factor test indicated that the first factor accounted for 29.4% of total variance, below the 50% threshold. In addition, full collinearity assessment (Kock, 2015) showed that all variance inflation factors (VIFs) were below 3.3. These results indicate that common method bias is unlikely to affect the interpretation of the results. Overall, these procedures ensure the robustness and reliability of the estimated relationships and are consistent with best practices in PLS-SEM applications (Hair et al., 2019).

3.7 Validity, Reliability, and Trustworthiness

Content validity was established through expert review and pilot testing. Construct validity was assessed through measurement model evaluation, ensuring that indicators

adequately represent their respective constructs. Reliability was confirmed using composite reliability and Cronbach's alpha, both exceeding recommended thresholds (Hair et al., 2019). Discriminant validity was established through Fornell-Larcker and HTMT criteria.

3.8 Ethical Considerations

Participation was voluntary. Respondents were informed about the study purpose prior to data collection. Informed consent was obtained verbally for face-to-face surveys and through agreement statements for online responses. All responses were anonymized, and no personal identifiers were recorded. Data were securely stored and accessed only by the research team.

3.9 Research Procedure

The research was conducted through several systematic stages. First, the study was designed based on theoretical and empirical literature, followed by the development of research instruments. Second, expert validation and pilot testing were conducted to refine the questionnaire. Third, data were collected through both face-to-face and online methods. Fourth, the collected data were screened and prepared for analysis. Finally, data analysis was performed using PLS-SEM, followed by interpretation and reporting of the results.

3.10 Methodological Limitations

This study has several methodological limitations. First, the use of purposive sampling may limit the generalizability of the findings beyond the study context. Second, the cross-sectional design restricts the ability to capture dynamic changes in perceptions over time. Third, the reliance on self-reported data may introduce response bias, although procedural and statistical remedies were applied to mitigate this issue. Despite these limitations, the study employs rigorous methodological procedures and robust analytical techniques, ensuring the validity and reliability of the findings while providing a strong basis for future research.

4. Results and Discussion

4.1 Research Results

4.1.1 *Sample Description and Descriptive Statistical Analysis*

Data screening revealed minimal missing values (<2%), handled using mean substitution. No univariate or multivariate outliers were detected. Skewness and kurtosis were within acceptable ranges for PLS-SEM.

Table 1. Descriptive Statistics

Construct	Items	Mean Range	SD Range
Financial Incentives	3	3.24-3.56	0.67-0.82
Non-Financial Incentives	3	3.67-3.89	0.71-0.85
Combination Incentives	2	3.92-4.08	0.63-0.74
Perceived Effectiveness	6	2.87-3.45	0.79-0.96

Source: Data processed, 2026

Financial incentives show moderate means (3.24-3.56), indicating smallholders perceive monetary support as relevant. Non-financial incentives exhibit higher means (3.67-3.89), suggesting capacity-building and legitimacy mechanisms are particularly valued. Combination items show highest means (3.92-4.08), reflecting strong agreement that integrated support would be beneficial, contrasting with subsequent structural results.

Perceived effectiveness items show substantial variation (2.87-3.45), indicating heterogeneity in how farmers evaluate support.

4.1.2 Data Quality and Preliminary Analysis

Harman's single-factor test showed the first factor accounted for 29.4% of total variance, below the 50% threshold. Full collinearity assessment showed all VIFs below 3.3, indicating common method bias is not a significant threat (Kock, 2015).

4.1.3 Main Analytical Results

Initial assessment identified three indicators of perceived effectiveness with outer loadings below 0.60. These indicators were removed iteratively to improve convergent validity. The final model consists of 11 indicators across four constructs.

Table 2. Measurement Model Assessment

Construct	CR	AVE	1	2	3	4
1. Financial Incentives	0.81	0.59	**0.77**			
2. Non-Financial Incentives	0.83	0.62	0.38	**0.79**		
3. Combination Incentives	0.86	0.75	0.23	0.30	**0.87**	
4. Perceived Effectiveness	0.81	0.43	0.43	0.50	0.33	**0.66**

Note: Diagonal (bold) = square root of AVE; off-diagonal = construct correlations.
Source: Data processed, 2026

Composite Reliability values exceeded the recommended threshold of 0.70 for all constructs, indicating satisfactory internal consistency. Cronbach's Alpha values were above 0.60, which is acceptable for exploratory research. The AVE values for financial incentives (0.59), non-financial incentives (0.62), and combination incentives (0.75) exceeded the recommended threshold of 0.50, indicating satisfactory convergent validity.

The AVE value for perceived effectiveness was 0.43, slightly below the recommended threshold of 0.50. However, the construct was retained because its composite reliability exceeded 0.70 and the majority of indicator loadings were above 0.70, indicating satisfactory internal consistency. According to Fornell & Larcker (1981), convergent validity may still be considered adequate when composite reliability is acceptable, even if AVE is marginally below the threshold.

Discriminant validity was confirmed via the Fornell-Larcker criterion (square root of AVE exceeds correlations) and HTMT ratios below 0.85 (Henseler et al., 2015). Collinearity assessment shows all VIFs below 2.5, well under the threshold of 5.

4.1.4 Hypothesis Testing Results / Key Findings

The structural model explains 34.4% of variance in perceived effectiveness (R^2 = 0.344; adjusted R^2 = 0.330), representing moderate explanatory power in behavioral research (Hair et al., 2019). Stone-Geisser's Q^2 of 0.21 confirms predictive relevance. Bootstrapping with 5,000 resamples tested hypothesized relationships. All three incentive types exhibit positive and significant effects on perceived effectiveness

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Table 3. Hypothesis Testing Results

Hypothesis	Path	β	t-value	p-value	f^2	Result
H1	Financial → Perceived Effectiveness	0.261	3.631	<0.001	0.07	Supported
H2	Non-Financial → Perceived Effectiveness	0.352	4.320	<0.001	0.12	Supported
H3	Combination → Perceived Effectiveness	0.165	2.002	0.046	0.03	Supported

Source: Data processed, 2026

H1: Financial incentives positively influence perceived effectiveness (β = 0.261, $p < 0.001$, $f^2 = 0.07$). Smallholders who value input subsidies, price premiums, and replanting funds report higher support effectiveness. The effect size is small-to-medium, indicating financial mechanisms contribute to perceived support but are not the dominant factor.

H2: Non-financial incentives positively influence perceived effectiveness (β = 0.352, $p < 0.001$, $f^2 = 0.12$). Technical training, market access facilitation, and government recognition emerge as the most influential mechanisms. The effect size approaches medium, suggesting enabling forms of support are particularly consequential in shaping farmer perceptions.

H3: Combination incentives positively influence perceived effectiveness (β = 0.165, $p = 0.046$, $f^2 = 0.03$). While statistically significant, the effect is weaker than both non-financial and financial incentives alone, raising questions about assumptions that integrated support automatically produces stronger perceived outcomes.

4.1.5 Visual Presentation of Results

The empirical results are summarized in Tables 1–3 to enhance clarity and readability. Each table provides a structured representation of descriptive statistics, measurement model evaluation, and hypothesis testing outcomes.

4.2 Research Discussion

4.2.1 Interpretation of Key Findings

A consistent pattern emerges in how independent smallholders evaluate different types of support for ISPO certification. Beyond reporting relative effect sizes, understanding the mechanisms underlying these patterns is essential for explaining how control mechanisms operate in extra-organizational contexts.

Non-financial incentives emerged as the strongest mechanism (β = 0.352, $p < 0.001$). This effect can be explained by three interconnected mechanisms. First, technical training addresses capability deficits by reducing information asymmetry and enhancing self-efficacy. When farmers understand certification requirements and how to meet them, compliance becomes more feasible. This aligns with psychological research linking self-efficacy to sustained behavioral change (Ryan & Deci, 2020). Second, market access facilitation strengthens outcome expectancy by linking certification to tangible economic opportunities, transforming compliance from a cost into a potential benefit (Attallah et al., 2022). Third, government recognition enhances legitimacy and functions as cultural control (Malmi & Brown, 2008), encouraging internalization of sustainability practices. Together, these enabling controls

build capability, motivation, and legitimacy, addressing the underlying conditions necessary for compliance. These results reinforce prior research showing that enabling controls (Adler & Borys, 1996) are particularly effective in contexts characterized by capability constraints and limited institutional trust (Ahmad et al., 2024; Anshari et al., 2025).

Financial incentives demonstrated a positive but comparatively moderate effect ($\beta = 0.261$, $p < 0.001$). While subsidies, premiums, and replanting funds remain important for reducing liquidity constraints, their influence appears limited to addressing economic barriers. They do not directly resolve knowledge deficits or administrative challenges associated with certification (Supriatna et al., 2024; Watts et al., 2021). This pattern is consistent with motivation crowding theory, which suggests that reliance on extrinsic rewards may weaken intrinsic motivation when compliance is perceived primarily as an economic transaction (Li et al., 2021; Ling & Xu, 2021). Thus, financial incentives appear necessary but insufficient for sustaining compliance.

Combination incentives showed the weakest, though still significant, effect ($\beta = 0.165$, $p < 0.05$). A discrepancy emerges between the theoretical expectation of synergy and how integrated support is experienced in practice. Specifically, while complementarity theory predicts that combining financial and non-financial incentives should enhance effectiveness, the results indicate that such effects may not materialize in practice. This gap reflects a disconnect between designed integration and perceived coherence, which is examined further in the following section.

4.2.2 The Combination Incentives Paradox

A notable finding is the comparatively weaker effect of combination incentives despite their high descriptive evaluation. Farmers express strong agreement that integrated support should be more effective (mean = 3.92–4.08), yet this expectation is not reflected in the structural relationships ($\beta = 0.165$), indicating a discrepancy between perceived desirability and experienced effectiveness.

This pattern can be conceptualized as a "combination incentives paradox", where theoretically complementary mechanisms do not produce stronger perceived effectiveness. Drawing on management control systems literature, the paradox can be interpreted through the lens of conditional complementarity. While complementarity theory suggests that combining controls addressing different dimensions should enhance effectiveness (Grabner & Moers, 2013), such effects depend on coherence, coordination, and how control mechanisms are experienced.

In this study, the weaker effect of combination incentives suggests that complementarity is contingent on implementation conditions rather than automatic. When financial and non-financial incentives are delivered through fragmented institutional arrangements, they may be perceived as disjointed rather than integrated. This reduces perceived coherence and undermines the synergy expected from control packages (Brown & Malmi, 2024), providing empirical support for the argument that complementarity among control mechanisms is conditional rather than inherent.

Several contextual factors may explain this perceived fragmentation. First, institutional coordination challenges arise when different incentives are administered by separate agencies with distinct procedures and communication channels (Putri et al., 2022; Watts et al., 2021). Second, administrative burden may offset perceived benefits when farmers must navigate multiple programs simultaneously (Li et al., 2021). Third, prior experiences with inconsistent program delivery may reduce trust in integrated interventions (Grabner & Moers, 2013).

These findings suggest that integration must be experienced at the user level rather than merely designed at the policy level. The paradox observed in this study reinforces the theoretical argument that control package effectiveness depends not only on the presence

of multiple mechanisms but also on their coherence and perceived integration, thereby extending MCS theory to extra-organizational governance contexts.

4.2.3 Comparison with Previous Studies

The stronger influence of non-financial incentives is consistent with a growing body of research across sustainability contexts. Studies in forest restoration (Tedesco et al., 2023), agricultural sustainability (Attallah et al., 2022), and capacity-building interventions have been widely shown to support sustained behavioral change across contexts (e.g., Attallah et al., 2022; Tedesco et al., 2023), reinforcing the role of enabling controls in shaping sustained behavior. This cross-context consistency strengthens the generalizability of the enabling-controls perspective.

However, the findings also contrast with studies emphasizing financial incentives as primary drivers of compliance in resource-constrained settings (Pramudya et al., 2022; Wibowo et al., 2023). This divergence highlights that the effectiveness of incentives depends on the nature of compliance requirements. Capability-intensive certification systems, such as ISPO, favor enabling controls that build competence, whereas cost-intensive contexts may respond more strongly to financial mechanisms.

Regarding combination incentives, the findings challenge the commonly assumed synergy in integrated incentive designs (Tedesco et al., 2023). Instead, they support the view that complementarity is an empirical question rather than a theoretical given (Grabner & Moers, 2013). Recent research further highlights that interactions among controls can create tensions and reduce effectiveness when coordination is weak (Brown & Malmi, 2024; Dimes & de Villiers, 2021). The present study extends this insight by demonstrating that such dynamics also apply in sustainability governance contexts involving dispersed actors.

4.2.4 Theoretical Contributions

This study contributes to management accounting literature by extending the application of management control systems to extra-organizational sustainability governance contexts. Specifically, it demonstrates that the distinction between outcome-based and enabling controls remains relevant beyond organizational boundaries.

More importantly, the findings challenge the assumption of inherent complementarity in integrated incentive designs. While prior literature often treats complementarity as inherently beneficial, this study shows that combining control mechanisms does not necessarily enhance perceived effectiveness. Instead, complementarity is conditional on coherence and implementation quality.

This insight advances the concept of control packages by showing that their effectiveness depends on how mechanisms are perceived and experienced by target actors. In fragmented institutional environments, integrated designs may fail to produce the expected synergy, resulting in the combination incentives paradox observed in this study.

4.2.5 Practical and Policy Implications

Several implications emerge for policymakers and implementing agencies. First, capacity-building interventions warrant continued emphasis. The strong influence of non-financial incentives indicates that training, market facilitation, and recognition address core barriers to certification. Designing programs that enhance both technical and administrative capabilities may improve perceived effectiveness (Anshari & Hamdan, 2023).

Second, financial incentives should be integrated more deliberately with capability-building mechanisms. Linking financial support to participation in training programs may improve coherence and strengthen perceived effectiveness. Third, addressing institutional fragmentation is critical. The weaker effect of combination incentives suggests that improving coordination across agencies may be as

important as selecting appropriate incentive types. Streamlined procedures, consistent communication, and integrated service delivery models may enhance perceived coherence.

Fourth, incorporating farmer perspectives into program evaluation may improve policy effectiveness. Understanding how support mechanisms are experienced can complement traditional output-based metrics and provide insights into program design.

4.2.6 Integration with the Research Gap

This study directly addresses the research gaps identified in the literature. First, it provides a comparative analysis of financial, non-financial, and combination incentives within a unified framework. Second, it incorporates perceived effectiveness as a key outcome variable, offering insights into how incentive mechanisms are evaluated by target actors. Third, it extends management control research into extra-organizational contexts, demonstrating how control mechanisms operate in sustainability governance settings.

4.2.7 Acknowledgement of Study Limitations

Several limitations should be acknowledged. The cross-sectional design limits causal inference, and the findings are based on perceptions rather than observed certification outcomes. The sample is drawn from a single province, which may limit generalizability.

Additionally, the study infers fragmentation as a mechanism without directly measuring it. Future research should incorporate measures of perceived coherence and institutional coordination to test the proposed mechanisms more explicitly.

Longitudinal studies examining the relationship between perceived effectiveness and actual certification adoption would further strengthen understanding of how incentive mechanisms influence behavior over time.

5. Conclusion

5.1 Summary of Key Findings

This study examined how financial, non-financial, and combination incentives influence independent smallholders' perceived effectiveness of support for ISPO certification adoption in South Kalimantan. Using survey data from 143 respondents analyzed with PLS-SEM, the findings provide several important insights.

First, all three types of incentives significantly influence perceived effectiveness, indicating that each mechanism contributes to shaping how farmers evaluate support programs. However, their relative influence differs in meaningful ways.

Second, non-financial incentives emerge as the most influential mechanism. This finding highlights the importance of enabling forms of support, such as technical training, market access facilitation, and government recognition. These mechanisms appear to address core constraints faced by smallholders, particularly capability limitations and the need for legitimacy, which are central to certification readiness.

Third, financial incentives, while significant, show a more moderate effect. This suggests that although financial support helps reduce economic barriers, it does not fully address the procedural and knowledge-related challenges associated with certification.

Fourth, combination incentives demonstrate the weakest effect despite being positively evaluated by respondents. This finding indicates a gap between the perceived desirability of integrated support and its experienced effectiveness. Taken together, these results suggest that the effectiveness of incentive mechanisms depends less on their availability and more on how they address capability constraints and are experienced by farmers.

5.2 Theoretical Contributions

This study contributes to the management accounting and sustainability literature in several ways. First, it provides

comparative empirical evidence on how different incentive mechanisms influence perceived effectiveness in a mandatory certification context. By distinguishing between financial, non-financial, and combination incentives, the study moves beyond the dominant approach of examining incentives in isolation.

Second, the findings extend the application of management control systems concepts to extra-organizational sustainability governance contexts. In particular, the distinction between outcome-based and enabling controls remains relevant in explaining how support mechanisms operate beyond formal organizational boundaries.

More importantly, the study challenges the commonly assumed complementarity of integrated incentive designs. While prior literature often treats combined incentives as inherently synergistic, the findings demonstrate that such complementarity is conditional rather than automatic. In this context, the study identifies a "combination incentives paradox", where integrated support is perceived as desirable but does not translate into stronger perceived effectiveness. This insight highlights the importance of coherence and perceived integration in determining the effectiveness of control packages, thereby extending MCS theory to fragmented institutional settings.

5.3 Practical and Policy Implications

The findings offer several implications for policymakers and implementing agencies involved in ISPO support programs. First, capacity-building interventions should remain a central component of program design. The strong influence of non-financial incentives indicates that training, market facilitation, and recognition directly address farmers' perceived needs. Ensuring that such programs cover both technical and administrative aspects of certification may enhance their effectiveness.

Second, financial incentives should be designed in closer alignment with capability-building efforts. Linking subsidies or financial support to participation in training programs may create more coherent support systems and improve perceived effectiveness.

Third, improving coordination across implementing agencies is critical. The relatively weaker effect of combination incentives suggests that fragmented delivery may reduce perceived coherence. Streamlining procedures, ensuring consistent communication, and clarifying how different programs are connected may enhance user experience.

Fourth, incorporating farmer perspectives into program evaluation may provide valuable insights. Understanding how support mechanisms are experienced, rather than relying solely on output indicators, can inform more responsive and effective policy design.

5.4 Limitations of the Study

This study has several limitations. First, the sample is limited to independent smallholders in South Kalimantan, which may restrict the generalizability of the findings to other regions or certification contexts. Second, the cross-sectional design limits the ability to draw causal conclusions about the long-term effects of perceived support on certification adoption.

Third, the study relies on perceptual measures of effectiveness, which capture subjective evaluations rather than actual behavioral outcomes. Fourth, the AVE value for perceived effectiveness, although acceptable given adequate composite reliability, indicates that measurement refinement may improve construct validity in future research.

5.5 Directions for Future Research

Future research may extend this study in several directions. First, longitudinal studies could examine whether perceived effectiveness translates into actual certification adoption over time, providing stronger evidence on behavioral outcomes.

Second, future studies could incorporate additional explanatory variables, such as institutional trust, prior program experience, or

farmer group dynamics, to better understand factors shaping perceptions of support.

Third, comparative research across regions or certification schemes may help identify how contextual differences influence the effectiveness of incentive mechanisms.

Fourth, qualitative approaches, including interviews and focus groups, could provide deeper insight into how smallholders interpret and experience different forms of support.

Finally, research examining different implementation models, particularly variations in coordination and integration, would help clarify how delivery design affects perceived effectiveness, complementing the present study's focus on incentive types.

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