# Elaboration of Green Supply Chain Management to Improve Green Process Innovation Performance in UMKM Batik Lasem

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***ABSTRACT***
*The Batik Lasem industry, known for its rich cultural heritage, faces significant challenges in achieving sustainability amidst increasing environmental concerns and global market competition. This study aims to evaluate the implementation of Green Supply Chain Management (GSCM) to enhance Green Process Innovation Performance in Batik Lasem MSMEs. Using a mixed-method approach, the research collected data from 100 MSMEs in Rembang, Central Java, combining quantitative surveys and qualitative interviews to gain comprehensive insights. The findings indicate that GSCM significantly reduces waste, optimizes resource utilization, and minimizes environmental impact, thus improving operational efficiency and competitiveness. Key components such as green purchasing, waste reduction, and eco-friendly manufacturing processes emerged as critical drivers of innovation. Moreover, the study highlights the importance of stakeholder collaboration, digital transformation, and policy support in fostering long-term sustainability. The paper concludes that effective GSCM practices not only enhance the financial performance of MSMEs but also strengthen their market position by meeting the growing demand for environmentally responsible products. This research provides practical recommendations for MSMEs seeking to balance economic growth with environmental responsibility, promoting resilience in an increasingly competitive global marketplace.*

***Keywords**: Green Supply Chain Management, Green Relational Capital, Green Process Innovation Performance*

***Elaborasi Green Supplay Chain Management Guna Meningkatkan Green Process Innovation Performance Pada UMKM Batik Lasem***

**Abstrak**
Industri Batik Lasem, yang dikenal dengan warisan budayanya yang kaya, menghadapi tantangan yang signifikan dalam mencapai keberlanjutan di tengah meningkatnya kepedulian terhadap lingkungan dan persaingan pasar global. Penelitian ini bertujuan untuk mengevaluasi implementasi Green Supply Chain Management (GSCM) untuk meningkatkan Kinerja Inovasi Proses Hijau di UMKM Batik Lasem. Dengan menggunakan pendekatan metode campuran, penelitian ini mengumpulkan data dari 100 UMKM di Rembang, Jawa Tengah, dengan menggabungkan survei kuantitatif dan wawancara kualitatif untuk mendapatkan wawasan yang komprehensif. Temuan menunjukkan bahwa GSCM secara signifikan mengurangi limbah, mengoptimalkan pemanfaatan sumber daya, dan meminimalkan dampak lingkungan, sehingga meningkatkan efisiensi operasional dan daya saing. Komponen-komponen utama seperti pembelian ramah lingkungan, pengurangan limbah, dan proses manufaktur yang ramah lingkungan muncul sebagai pendorong inovasi yang sangat penting. Selain itu, penelitian ini menyoroti pentingnya kolaborasi pemangku kepentingan, transformasi digital, dan dukungan kebijakan dalam mendorong keberlanjutan jangka panjang. Penelitian ini menyimpulkan bahwa

praktik-praktik GSCM yang efektif tidak hanya meningkatkan kinerja keuangan UMKM, tetapi juga memperkuat posisi mereka di pasar dengan memenuhi permintaan yang terus meningkat akan produk yang bertanggung jawab terhadap lingkungan. Penelitian ini memberikan rekomendasi praktis bagi UMKM yang ingin menyeimbangkan pertumbuhan ekonomi dengan tanggung jawab terhadap lingkungan, serta mendorong ketahanan di pasar global yang semakin kompetitif.

**Kata Kunci**: *Green Supply Chain Management, Green Relational Capital, Green Process Innovation Performance*

## BACKGROUND

The Batik Lasem industry, known for its rich cultural heritage and intricate designs, holds a significant place in Indonesia's creative economy. However, this traditional craft faces considerable challenges in the modern business environment, particularly in terms of sustainability. Batik Lasem, produced predominantly by micro, small, and medium enterprises (MSMEs) in Rembang, Central Java, relies heavily on natural dyes and manual production processes, making it a key cultural asset but also a significant source of environmental pollution.

The rise of global environmental awareness and stricter regulatory standards have intensified the pressure on MSMEs to adopt sustainable business practices. The growing demand for eco-friendly products and the increasing importance of environmental performance in global trade have further highlighted the need for green innovations. However, most Batik Lasem MSMEs face structural and financial constraints that hinder their ability to implement green practices effectively.

This study focuses on the application of Green Supply Chain Management (GSCM) as a strategic framework to enhance the sustainability and competitiveness of Batik Lasem MSMEs. GSCM integrates traditional supply chain management practices with environmental considerations, aiming to minimize waste, reduce carbon footprints, and promote resource efficiency. It involves multiple components, including green purchasing, waste management, reverse logistics, and eco-design, all of which are critical for improving the environmental performance of MSMEs.

The problem, however, lies in the limited awareness and adoption of GSCM among Batik Lasem entrepreneurs. Despite the potential benefits, many MSMEs lack the knowledge, resources, and technical expertise needed to integrate green practices into their operations. Financial constraints, technological gaps, and cultural resistance further complicate this transition.

Additionally, Batik Lasem production processes are known for their significant water and energy consumption, as well as the use of hazardous chemicals in dyeing and processing. These practices not only pose environmental risks but also threaten the long-term viability of the industry in an increasingly eco-conscious global market.

According to (Zhu et al., 2008), environmental impacts occur at all stages of a product's life cycle from resource extraction to manufacture, reuse, recycling and disposal. Green Supply Chain Management practices which include green purchasing, green manufacturing, materials management, green distribution/ marketing and reverse logistics refer to the involvement of environmental thinking into supply chain management from raw material extraction to product design, manufacturing processes, final product delivery to consumers and end-of-life management.

### Research Objectives

This section will explore the current challenges faced by Batik Lasem MSMEs in

adopting GSCM, the critical role of green process innovation in achieving long-term sustainability, and the strategic importance of GSCM for enhancing their competitiveness. It will also discuss the broader implications for policymakers, industry stakeholders, and researchers seeking to promote sustainable development in the MSME sector.

- Key objectives of this section include:
- Identifying the key challenges and barriers to GSCM adoption among Batik Lasem MSMEs.
- Analyzing the potential benefits of integrating GSCM in improving green process innovation.
- Assessing the role of stakeholder collaboration, digital technologies, and policy support in facilitating sustainable transitions.
- Highlighting the strategic importance of GSCM for MSMEs seeking to enhance their competitive advantage in the global market.

## RESEARCH METHODS

The study used quantitative methods by distributing research questionnaires regarding Green Strategic Intent, Green Human, Organizational, Relational Capital, Green Supply Chain Management and Green Process Innovation Performance at UMKM Batik Lasem in Rembang Regency. The population of this study were UMKM Batik Lasem that sell both offline and online. The sampling technique used in this study was purposive sampling method with the number of samples of this study referring to where the minimum sample was 100 for SEM analysis tools.

## RESULTS AND DISCUSSION

The characteristics of respondents as subjects in this study can be seen in Table 1

**Table 1 Respondent Characteristics**

| Kriteria | Characteristics | Persentase |
|---|---|---|
| Gender | Female | 66% |
| | Male | 34% |
| Age | 15-30 y.o. | 30% |
| | 31-40 y.o. | 33% |
| | 41-50 y.o. | 24% |
| | > 50 y.o. | 13% |
| Education | JHS | 0% |
| | SHS | 6% |
| | DIPLOMA | 26% |
| | BACHELOR | 68% |
| Age of UMKM | ≥3 y.o. | 36% |
| | 4-5 y.o. | 32% |
| | 6-7 y.o. | 20% |
| | ≥8 y.o. | 12% |

Source: Primary data processed, 2024.

In this study, there were 100 respondents consisting of business actors of UMKM Batik Lasem in Rembang Regency as respondents. In the characteristics of the respondents, it can be seen that business actors are dominated by those who are at a productive age and understand technology so that it makes it easier for businesses to keep up with the times, and the relatively young age of the business makes business actors in the respondents of this study show the growth phase.

**Evaluation of Data Normality**

The conclusion of the Normality Test in the study is presented in Table 2.

Table 2

**Table 2 Assessment of Normality**

| Variable | min | max | skew | c.r. | kurtosis | c.r. |
|---|---|---|---|---|---|---|
| GOC3 | 1,000 | 5,000 | ,040 | ,163 | -,501 | -1,024 |
| GOC4 | 1,000 | 5,000 | -,006 | -,026 | -,487 | -,994 |
| GPIP3 | 1,000 | 5,000 | -,163 | -,666 | -,280 | -,571 |
| GPIP2 | 1,000 | 5,000 | ,064 | ,260 | -,266 | -,542 |
| GPIP1 | 1,000 | 5,000 | -,049 | -,201 | -,339 | -,693 |
| GSCM3 | 1,000 | 5,000 | ,138 | ,564 | -,573 | -1,170 |
| GSCM2 | 1,000 | 5,000 | -,160 | -,654 | -,307 | -,628 |
| GSCM1 | 1,000 | 5,000 | ,080 | ,327 | -,615 | -1,254 |
| GRC4 | 1,000 | 5,000 | ,009 | ,036 | -,603 | -1,230 |
| GRC3 | 1,000 | 5,000 | -,012 | -,051 | -,312 | -,637 |
| GRC2 | 1,000 | 5,000 | -,083 | -,338 | -,308 | -,628 |
| GRC1 | 1,000 | 5,000 | ,024 | ,100 | -,509 | -1,040 |
| GOC2 | 1,000 | 5,000 | ,072 | ,295 | -,490 | -1,001 |
| GOC1 | 1,000 | 5,000 | ,008 | ,034 | -,443 | -,905 |
| GHC4 | 1,000 | 5,000 | -,125 | -,511 | -,465 | -,949 |
| GHC3 | 1,000 | 5,000 | ,065 | ,265 | -,633 | -1,293 |
| GHC2 | 1,000 | 5,000 | -,100 | -,408 | -,432 | -,883 |
| GHC1 | 1,000 | 5,000 | ,020 | ,081 | -,259 | -,529 |
| GSI4 | 1,000 | 5,000 | -,060 | -,245 | -,518 | -1,057 |
| GSI3 | 1,000 | 5,000 | -,060 | -,245 | -,356 | -,728 |
| GSI2 | 1,000 | 5,000 | ,076 | ,309 | -,630 | -1,286 |
| GSI1 | 1,000 | 5,000 | ,040 | ,163 | -,317 | -,647 |
| Multivariate | | | | | 16,491 | 2,537 |

Source: Primary data processed, 2024.

Based on the results of the normality test presented above in Table 2, it results that the data is normally distributed univariate and multivariate with univariate values none of which exceed the critical limit (c.r) of a variable ± 2.58 and multivariate presented at 2.537. The processed data can be said to be normal if it has a critical value (c.r) which is ± 2.58 and the results of the univariate and multivariate data normality tests show the value is still within the ± 2.58 value range (Ghozali, 2017).

**Univariate & Multivariate Outlier Evaluation**

Mahalanobis Distance to measure whether or not there is data that is an outlier (destructive data), namely by looking at the observation score which is very different from the centroid score for 100 cases. Table 3 shows that the minimum mahalanobis distance listed is 31.595 and the maximum distance is 37.032. Data outliers are perceived from the mahalanobis value that exceeds the chi-square value. In this study, the chi-square of the degree of freedom of 25 (number of variable indicators) at the 0.01 significance level is 34.382, so it is stated that there are no outliers, (Ghozali, 2017). As presented in Table 3.

**Table 3 Mahalanobis distance**

| Observation number | Mahalanobis d-squared | p1 | p2 |
|---|---|---|---|
| **28** | 37,032 | ,023 | ,907 |
| **16** | 37,011 | ,024 | ,686 |
| **20** | 35,934 | ,031 | ,600 |
| **59** | 35,487 | ,034 | ,453 |
| **63** | 35,396 | ,035 | ,277 |
| **68** | 35,279 | ,036 | ,155 |
| **39** | 35,088 | ,038 | ,086 |
| **22** | 34,551 | ,043 | ,068 |
| **75** | 32,911 | ,063 | ,180 |
| **14** | 32,790 | ,065 | ,114 |
| **26** | 31,724 | ,082 | ,199 |
| **62** | 31,595 | ,085 | ,138 |

Source: Primary data processed, 2024.

**Multicollinearity Evaluation**

According to (Hair et al, 2010) multicollinearity symptoms can be seen through matrix sample correlations, if the resulting value of each indicator is smaller than (<) 0.90, it can be stated that there are no multicollinearity symptoms. In this study, the results of data processing showed that there were no multicollinearity symptoms in the matrix sample correlations of 21 indicators spread across the six variables tested, as presented in the Table 4.

**Table 4 Matrix Sample Correlations**

| | GOC3 | GOC4 | GPIP3 | GPIP2 | GPIP1 | GSCM3 | GSCM2 | GSCM1 | GRC4 | GRC3 | GRC2 | GRC1 | GOC2 | GOC1 | GHC4 | GHC3 | GHC2 | GHC1 | GSI4 | GSI3 | GSI2 | GSI1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GOC3 | 1,000 | | | | | | | | | | | | | | | | | | | | | |
| GOC4 | ,619 | 1,000 | | | | | | | | | | | | | | | | | | | | |
| GPIP3 | ,563 | ,616 | 1,000 | | | | | | | | | | | | | | | | | | | |
| GPIP2 | ,623 | ,662 | ,550 | 1,000 | | | | | | | | | | | | | | | | | | |
| GPIP1 | ,650 | ,622 | ,488 | ,526 | 1,000 | | | | | | | | | | | | | | | | | |
| GSCM3 | ,777 | ,630 | ,584 | ,606 | ,591 | 1,000 | | | | | | | | | | | | | | | | |
| GSCM2 | ,535 | ,598 | ,721 | ,551 | ,555 | ,546 | 1,000 | | | | | | | | | | | | | | | |
| GSCM1 | ,628 | ,545 | ,564 | ,672 | ,649 | ,640 | ,470 | 1,000 | | | | | | | | | | | | | | |
| GRC4 | ,730 | ,672 | ,519 | ,632 | ,554 | ,732 | ,493 | ,664 | 1,000 | | | | | | | | | | | | | |
| GRC3 | ,610 | ,623 | ,518 | ,675 | ,549 | ,466 | ,570 | ,613 | ,523 | 1,000 | | | | | | | | | | | | |
| GRC2 | ,542 | ,638 | ,691 | ,560 | ,574 | ,554 | ,731 | ,554 | ,589 | ,441 | 1,000 | | | | | | | | | | | |
| GRC1 | ,565 | ,607 | ,570 | ,575 | ,586 | ,530 | ,524 | ,637 | ,571 | ,564 | ,542 | 1,000 | | | | | | | | | | |
| GOC2 | ,660 | ,647 | ,719 | ,588 | ,627 | ,615 | ,661 | ,604 | ,564 | ,629 | ,623 | ,620 | 1,000 | | | | | | | | | |
| GOC1 | ,579 | ,683 | ,590 | ,494 | ,551 | ,582 | ,589 | ,563 | ,608 | ,675 | ,579 | ,572 | ,567 | 1,000 | | | | | | | | |
| GHC4 | ,602 | ,516 | ,524 | ,595 | ,512 | ,456 | ,564 | ,594 | ,527 | ,591 | ,572 | ,640 | ,542 | ,507 | 1,000 | | | | | | | |
| GHC3 | ,727 | ,628 | ,631 | ,654 | ,695 | ,676 | ,631 | ,673 | ,628 | ,607 | ,585 | ,566 | ,622 | ,495 | ,533 | 1,000 | | | | | | |
| GHC2 | ,601 | ,716 | ,660 | ,643 | ,565 | ,651 | ,640 | ,611 | ,599 | ,601 | ,629 | ,572 | ,700 | ,589 | ,545 | ,538 | 1,000 | | | | | |
| GHC1 | ,633 | ,612 | ,559 | ,508 | ,439 | ,517 | ,519 | ,517 | ,563 | ,557 | ,495 | ,624 | ,568 | ,581 | ,524 | ,540 | ,540 | 1,000 | | | | |
| GSI4 | ,578 | ,612 | ,634 | ,568 | ,581 | ,636 | ,536 | ,670 | ,566 | ,648 | ,595 | ,642 | ,645 | ,659 | ,589 | ,625 | ,595 | ,527 | 1,000 | | | |
| GSI3 | ,561 | ,605 | ,666 | ,538 | ,623 | ,496 | ,736 | ,590 | ,519 | ,537 | ,798 | ,578 | ,648 | ,625 | ,610 | ,591 | ,667 | ,475 | ,573 | 1,000 | | |
| GSI2 | ,614 | ,624 | ,576 | ,757 | ,554 | ,636 | ,527 | ,680 | ,671 | ,655 | ,496 | ,596 | ,666 | ,565 | ,559 | ,644 | ,566 | ,526 | ,582 | ,496 | 1,000 | |
| GSI1 | ,629 | ,610 | ,631 | ,582 | ,682 | ,575 | ,641 | ,593 | ,582 | ,516 | ,640 | ,631 | ,587 | ,522 | ,563 | ,642 | ,671 | ,425 | ,538 | ,668 | ,468 | 1,000 |

Source: Primary data processed, 2024.

**Measurement Model Test**

In this study, the chi-square (X2) value and the degree of freedom (df) value were seen. Based on the results of the writing model test, it can be seen that the chi- square (X2) has a value of 261.953 and the degree of freedom (df) has a value of 181 as presented in Table 5.

Table 5

**Table 5 Evaluation Result Cut Value Criteria**

| ***Goodness-of-fit* indek** | ***Cut of Value*** | **Analysis Result** | **Model Evaluation** |
|---|---|---|---|
| Chi-Square | (Kecil) ≤ 191.306 | 261.953 | Marginal |
| Probability | ≥ 0.05 | 0.102 | Good |
| GFI | ≥ 0.90 | 0.830 | Marginal |
| IFI | ≥ 0.90 | 0.958 | Good |
| TLI | ≥ 0.90 | 0.944 | Good |
| CFI | ≥ 0.90 | 0.956 | Good |
| DF/CMIN | ≤ 2.00 | 1.447 | Good |
| RMSEA | ≤ 0.08 | 0.067 | Good |

Source: Primary data processed, 2024.

Table 5 Table 5 shows the goodness of fit criteria in the AMOS 24 program, indicating that the structural equation modeling analysis in this study can be accepted in accordance with the fit model with a Chi-square value = 261.953, Probability = 0.102 DF / CMIN = 1.447, GFI = 0.830, CFI = 0.956, TLI = 0.944 and RSMEA = 0.067. Based on this model fit, it can be concluded that the model fulfils the goodness of fit criteria. Therefore, the strutural equation model in this study is suitable and feasible to use so that it can be interpreted for further discussion (Ghozali, 2017).

The picture of the analysis results in this study which includes several variables, can be seen in the following table. Figure 1.

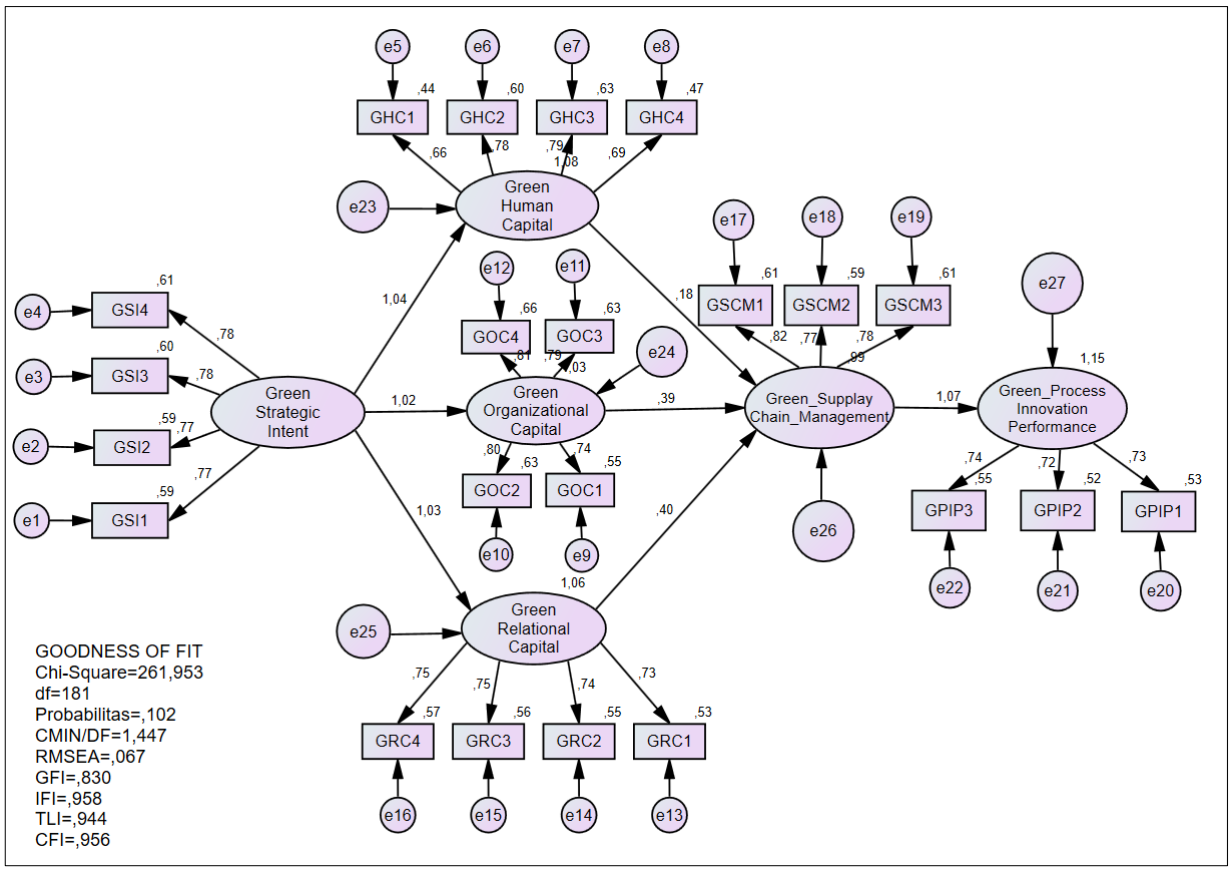


**Figure 1 Research Structural Model Analysis Results**

Source: Primary data processed, 2024.

**Hypothesis Testing**

At the stage of testing the hypothesis of a significant causal relationship, the critical ratio (c.r) value has a critical T value of ≥ 1.966. In making decision making easier, the author can see from the probability (P) number where (P) ≤ 0.05. If the value of P≤0.05 then H0 is accepted, and if on the contrary if the value of P≥0.05 then H0 is rejected, in the SEM package with the Amos 24 application the results of hypothesis testing can be seen through the regression weights output. (Ghozali, 2017). Hypothesis test results are presented in Table 6.

**Table 6 Hypothesis Test Results (Regression Weights)**

| | | | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| Green_Organizational_Capital | <--- | Green_Strategic_Intent | 1,037 | ,127 | 8,137 | *** |
| Green_Human_Capital | <--- | Green_Strategic_Intent | ,863 | ,130 | 6,654 | *** |
| Green_Relational_Capital | <--- | Green_Strategic_Intent | 1,022 | ,125 | 8,170 | *** |
| Green_Supplay_Chain_Management | <--- | Green_Human_Capital | ,251 | ,188 | 1,330 | ,183 |
| Green_Supplay_Chain_Management | <--- | Green_Relational_Capital | ,456 | ,191 | 2,392 | ,017 |
| Green_Supplay_Chain_Management | <--- | Green_Organizational_Capital | ,437 | ,205 | 2,128 | ,033 |
| Green_Process_Innovation_Performance | <--- | Green_Supplay_Chain_Management | ,865 | ,098 | 8,802 | *** |
| GSI1 | <--- | Green_Strategic_Intent | 1,000 | | | |
| GSI2 | <--- | Green_Strategic_Intent | 1,019 | ,137 | 7,420 | *** |
| GSI3 | <--- | Green_Strategic_Intent | ,997 | ,110 | 9,029 | *** |
| GSI4 | <--- | Green_Strategic_Intent | 1,037 | ,121 | 8,559 | *** |
| GHC1 | <--- | Green_Human_Capital | 1,000 | | | |
| GHC2 | <--- | Green_Human_Capital | 1,212 | ,164 | 7,383 | *** |
| GHC3 | <--- | Green_Human_Capital | 1,336 | ,178 | 7,525 | *** |
| GHC4 | <--- | Green_Human_Capital | 1,101 | ,166 | 6,625 | *** |
| GRC1 | <--- | Green_Relational_Capital | 1,000 | | | |
| GRC2 | <--- | Green_Relational_Capital | ,948 | ,122 | 7,787 | *** |
| GRC3 | <--- | Green_Relational_Capital | ,947 | ,121 | 7,850 | *** |
| GRC4 | <--- | Green_Relational_Capital | 1,020 | ,128 | 7,937 | *** |
| GPIP3 | <--- | Green_Process_Innovation_Performance | 1,030 | ,128 | 8,030 | *** |
| GOC4 | <--- | Green_Organizational_Capital | 1,056 | ,122 | 8,659 | *** |
| GOC3 | <--- | Green_Organizational_Capital | 1,063 | ,126 | 8,413 | *** |
| GOC2 | <--- | Green_Organizational_Capital | 1,057 | ,125 | 8,448 | *** |
| GOC1 | <--- | Green_Organizational_Capital | 1,000 | | | |
| GPIP2 | <--- | Green_Process_Innovation_Performance | ,996 | ,128 | 7,777 | *** |
| GPIP1 | <--- | Green_Process_Innovation_Performance | 1,000 | | | |
| GSCM2 | <--- | Green_Supplay_Chain_Management | ,875 | ,118 | 7,439 | *** |
| GSCM3 | <--- | Green_Supplay_Chain_Management | ,921 | ,105 | 8,790 | *** |
| GSCM1 | <--- | Green_Supplay_Chain_Management | 1,000 | | | |

Source: Primary data processed, 2024.

The findings of this study reveal significant insights into the implementation of Green Supply Chain Management (GSCM) and its impact on Green Process Innovation Performance (GPIP) among Batik Lasem MSMEs. The research highlights the critical role of green intellectual capital, including Green Strategic Intent (GSI), Green Human Capital (GHC), Green Organizational Capital (GOC), and Green Relational Capital (GRC), in driving sustainable business practices and enhancing competitive advantage.

1. The Role of Green Strategic Intent (GSI)

The study confirms that GSI plays a foundational role in shaping the sustainability performance of Batik Lasem MSMEs. Firms with a clear GSI are more likely to adopt green practices, reduce waste, and improve resource efficiency. This strategic intent aligns

organizational goals with environmental objectives, fostering a culture of continuous improvement and innovation. The positive and significant impact of GSI on GOC (1.037), GHC (0.863), and GRC (1.022) demonstrates that a strong commitment to sustainability can drive both internal capabilities and external partnerships, creating a robust foundation for green innovation.

2. The Importance of Green Human Capital (GHC)

Green human capital is a critical asset for MSMEs seeking to implement GSCM effectively. The study shows that companies that invest in their employees' green skills and knowledge are better positioned to reduce their environmental impact and enhance operational efficiency. However, the non-significant relationship between GHC and GSCM (0.251, $p = 0.183$) suggests that human capital alone is not sufficient to drive significant improvements in green process innovation. This finding underscores the need for a supportive organizational culture and strong external partnerships to fully leverage the potential of green human capital.

3. The Impact of Green Organizational Capital (GOC)

Organizational capital, which includes management systems, financial resources, and operational processes, emerged as a significant driver of GSCM in this study. The positive impact of GOC on GSCM (0.437, $p < 0.05$) indicates that firms with strong internal structures are more capable of implementing sustainable practices. This finding highlights the importance of leadership commitment, resource allocation, and continuous process improvement in achieving long-term sustainability.

4. The Role of Green Relational Capital (GRC)

The study also emphasizes the importance of external relationships in promoting GSCM. The positive and significant impact of GRC on GSCM (0.456, $p < 0.05$) demonstrates that close collaboration with suppliers, customers, and regulatory bodies can enhance green process innovation. This external support provides access to green technologies, eco-friendly raw materials, and best practices, reducing operational costs and improving overall sustainability performance.

5. Integration of GSCM and GPIP

The strong and significant relationship between GSCM and GPIP (0.865, $p < 0.001$) underscores the critical role of integrated supply chain management in achieving green innovation. This connection reflects the importance of adopting a holistic approach to sustainability, encompassing strategic intent, human capital, organizational readiness, and stakeholder collaboration. By integrating these elements, MSMEs can enhance their competitive advantage, reduce environmental impact, and improve long-term financial performance.

6. Practical Implications

For Batik Lasem MSMEs, the findings suggest several practical steps for improving sustainability, including investing in employee training, enhancing organizational structures, and building strong external partnerships. Policymakers should also consider providing financial incentives, technical support, and regulatory guidance to encourage green innovation in this sector.

## CONCLUSIONS AND SUGGESTIONS

The findings of this study on the elaboration of Green Supply Chain Management (GSCM) to enhance Green Process Innovation Performance (GPIP) in Batik Lasem MSMEs reveal significant insights into the strategic importance of integrating sustainable practices within traditional industries. This research has highlighted several critical factors that contribute to the successful implementation of GSCM, including the role of Green Strategic Intent (GSI), Green Human Capital (GHC), Green Organizational Capital (GOC), and Green Relational Capital (GRC) as key drivers of sustainability and innovation.

**Key Findings**:

Impact of Green Strategic Intent (GSI)

GSI, as a guiding principle for long-term environmental goals, significantly influences the sustainability performance of Batik Lasem MSMEs. The research confirms that firms with a strong GSI are more likely to develop innovative processes, reduce waste, and improve resource efficiency. This strategic focus enables firms to align their operational practices with environmental goals, ensuring long-term competitiveness in an increasingly eco-conscious market.

Role of Green Human Capital (GHC)

Human resources are critical to the successful implementation of GSCM. The study found that companies that invest in the skills, knowledge, and environmental awareness of their employees are better positioned to adopt sustainable practices. Training programs, continuous learning, and employee engagement in environmental initiatives were identified as crucial elements in building a workforce capable of driving green innovation.

Importance of Green Organizational Capital (GOC)

Organizational support structures, including leadership commitment, financial resources, and supportive corporate cultures, play a vital role in fostering GSCM adoption. The study reveals that firms with strong GOC are more likely to implement effective waste management systems, utilize eco-friendly technologies, and engage in continuous process improvement. This organizational readiness is essential for overcoming the technical and financial barriers associated with green innovation.

Influence of Green Relational Capital (GRC)

External partnerships and stakeholder engagement are critical for successful GSCM. The findings indicate that close collaboration with suppliers, customers, and regulatory bodies enhances the ability of MSMEs to access green technologies, optimize resource use, and reduce their environmental footprint. This relational capital supports the creation of sustainable supply chains and strengthens market competitiveness.

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