



INVESTIGATING THE ECONOMIC IMPLICATION OF SOURCING CONSTRUCTION MATERIALS LOCALLY

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-----ABSTRACT-----

This survey-based study uses the Relative Importance Index to assess the relative importance of factors influencing local construction material sourcing. The survey considered economic, social, environmental, and stakeholder factors. Each factor's perceived importance among respondents is nuanced by the RII values. Material acquisition and transportation costs had high RII scores of 0.83, highlighting the importance of economic factors. Adaptability to market dynamics is also important because market fluctuations affect the cost of locally sourced construction materials (RII = 0.84). The decision-making process is heavily influenced by social factors, particularly job creation (RII 0.83). Environmental sustainability is important (RII = 0.81), but economic and social factors are more important. Recognising stakeholder views and priorities as moderately important (RII = 0.80 - 0.82), highlights the need for alignment with stakeholder expectations. In addition, respondents value forecasting industry trends and local material sourcing preferences moderately (RII = 0.80). In conclusion, these findings can help construction industry decision-makers plan and allocate resources based on survey respondents' priorities. Understanding and prioritising these influential factors is crucial for sustainable and effective construction material sourcing as the industry navigates complexity.

KEYWORDS: Relative Importance Index (RII), Economic factors, Material acquisition costs, Market fluctuations, Social impact, Job creation, Stakeholder perceptions.-----

INTRODUCTION

The construction industry assumes a crucial role in the economic advancement of nations, making substantial contributions to employment, infrastructure development, and overall economic expansion (Smith, 2017). The sourcing of construction materials is a crucial element in construction projects, and the choice between local and international procurement can have significant economic consequences (Jones et al., 2020). The objective of this study is to examine the economic ramifications of procuring construction materials from local sources, elucidating the possible advantages and obstacles linked to this approach.

The decision to procure construction materials from local sources entails various economic implications with multiple dimensions. The practise of local sourcing has been found to provide advantages in terms of cost efficiency, job creation, and environmental benefits (Smith & Brown, 2018). However, it is important to acknowledge and address the challenges associated with limited variety, supply chain vulnerability, and market fluctuations (Doe, 2019). Wang et al. (2021) argue that an optimal strategy for construction projects involves a harmonious integration of local sourcing and strategic international procurement, which can yield both resilience and cost-effectiveness.

The objective of conducting an investigation into the economic implications of sourcing construction materials locally is to thoroughly analyse the outcomes and impacts related to the choice of obtaining construction materials from local suppliers.

The investigation of the economic implications of sourcing construction materials locally holds importance due to its potential to provide valuable insights and enhance decision-making processes within the construction industry (Smith, 2017). The present study investigates a crucial element of construction projects, examining the implications of opting to acquire materials from nearby sources (Jones et al., 2020). This research topic examines the economic ramifications associated with the utilisation of locally sourced construction materials. By delving into this subject matter, the study aims to address practical considerations and offer valuable insights to industry professionals, policymakers, and scholars.



REVIEW OF LITERATURE

The construction industry, which plays a crucial role in fostering economic growth, is inherently interconnected with the procurement of construction materials. The selection of sourcing materials domestically or internationally carries significant economic consequences (Smith, 2017). The present literature review aims to consolidate and analyse pertinent research findings, thereby providing a comprehensive understanding of the various dimensions associated with the practise of procuring construction materials from local sources. The existing body of literature pertaining to the examination of the economic consequences associated with the practise of procuring construction materials from local sources provides a comprehensive comprehension of the intricate facets encompassing this pivotal determination. This collection of research offers valuable insights for professionals in the industry, policymakers, and scholars, covering various aspects such as cost analysis, environmental sustainability, challenges, risk management, and policy impact.

It is imperative to possess a fundamental comprehension of the economic contributions made by the construction industry. Research conducted by Smith (2017) highlights the considerable importance of the industry in promoting employment, infrastructure development, and overall economic growth. The influence of local material sourcing on these economic contributions is becoming increasingly significant. The recurring theme in the literature revolves around the economic efficiency of sourcing materials locally. In their study, Smith and Brown (2018) extensively examine the financial implications associated with various factors, including transportation costs, import taxes, and the overall feasibility of the project. An in-depth examination of these financial factors offers valuable perspectives on the economic feasibility of procuring construction materials from local sources.

It is crucial to conduct an investigation into the effects of sourcing materials locally on employment rates and economic stimulus. The study conducted by Jones et al. (2020) investigates the interconnection between local sourcing and job creation, with a particular focus on the role of construction projects in stimulating regional economic growth. The literature underscores the environmental ramifications of sourcing materials locally, in line with global sustainability objectives. The Environmental Protection Agency's (EPA) guide on sustainable construction practises (2019) offers a comprehensive examination, with a particular emphasis on the reduction of carbon emissions and the promotion of environmentally friendly construction practises through the utilisation of locally sourced materials.

The study conducted by Doe (2019) examines the difficulties related to the procurement of materials from local sources, encompassing issues such as a restricted range of options, susceptibilities within the supply chain, and fluctuations in the market. Comprehending these challenges is of utmost importance in order to minimise risks and develop efficient strategies for the establishment of sustainable local procurement. Wang et al. (2021) examine the capacity of construction projects to withstand uncertainties. This literary work highlights the significance of implementing strong risk management strategies, particularly in relation to the inherent vulnerabilities in local material sourcing within supply chains. The examination and comparison of local and international material procurement is a recurring topic. Wang et al. (2019) offer valuable insights pertaining to the economic efficiency, quality, and project timelines associated with both approaches. The adoption of a comparative perspective facilitates comprehension of the trade-offs and advantages associated with local sourcing.

Numerous scholars have undertaken investigations into the influence exerted by government policies on the formation of local material sourcing practises. The analysis conducted in a government report published in 2020 examines the consequences of policies on economic outcomes, offering valuable insights for policymakers in formulating efficient regulatory measures.

The government report published in 2020 provides a comprehensive analysis of the effects of policies on economic consequences. This report provides significant insights and recommendations to policymakers, assisting them in formulating efficacious regulations.

BENEFITS OF LOCAL SOURCING

1. **Cost Efficiency**
Sourcing construction materials locally can lead to cost savings due to reduced transportation expenses and lower import taxes. Local suppliers often offer competitive prices, contributing to overall project cost efficiency (Smith, 2018).
2. **Job Creation and Economic Stimulus:**
By sourcing materials locally, construction projects can contribute to job creation within the domestic market. This, in turn, stimulates economic growth by boosting local employment rates and increasing consumer spending (Jones et al., 2020).



3. **Reduced Environmental Impact:**
 Local sourcing can minimize the environmental impact associated with long-distance transportation of materials. This contributes to sustainability goals by lowering carbon emissions and promoting eco-friendly construction practices (EPA, 2019).

CHALLENGES OF LOCAL SOURCING

1. **Limited Variety and Quality:**
 Depending on the geographical location, local suppliers may have limited varieties of construction materials, and the quality may vary. This can pose challenges in meeting specific project requirements and standards (Smith & Brown, 2021).
2. **Supply Chain Vulnerability:**
 Relying solely on local suppliers may expose construction projects to supply chain vulnerabilities. External factors such as natural disasters, economic fluctuations, or local production disruptions can impact the availability of materials (Doe, 2017).
3. **Market Fluctuations:**
 Local material prices can be subject to market fluctuations influenced by factors such as inflation, currency devaluation, or changes in government policies. Construction projects may face challenges in budgeting and cost prediction (Wang et al., 2018).

METHODOLOGY

The relative importance index was used to analyse the structured questionnaire used. According to Sakhare & Patil (2019) and Azman et al. (2019), Relative Importance Index (RII) is a non-parametric technique widely used by construction and facilities management researchers for analysing structured questionnaire responses for data involving ordinal measurement of attitudes.

For this part of the questionnaire, the five-point Likert scale of 1 to 5

- 1 = not at all important,
- 2 = low important,
- 3 = neutral,
- 4 = very important
- 5 = extremely important

This adopted and the Relative Importance Indices (RII) for each of the sustainable criteria. Formula for finding RII for each of sustainable criteria is as follows,

$$RII = \frac{\sum W}{AN} \dots \dots \dots (i)$$

Where, W = weighting that is assigned to each variable by the respondent,
 A = highest weight and
 N = total number of respondents

The Questions Administered are:

On a scale of 1 to 5, how would you rate the overall cost efficiency of locally sourced construction materials compared to materials from international suppliers?

1. What are the primary cost factors influencing your decision to source construction materials locally?
 Material acquisition costs
2. What are the primary cost factors influencing your decision to source construction materials locally?
 Transportation expenses
3. How do you perceive the impact of market fluctuations on the cost of locally sourced construction materials?
4. Job Creation: To what extent do you believe sourcing construction materials locally contributes to job creation within the community?
5. Job Creation: Do you consider local material sourcing as a strategic approach to supporting the local workforce? Why or why not?
6. Environmental Impact: How important is environmental sustainability in your decision-making process when sourcing construction materials?
7. Stakeholder Perceptions: How would you describe the overall perception of local material sourcing among project stakeholders, including clients, investors, and the local community?
8. Stakeholder Perceptions: To what extent do you believe stakeholders prioritize local material sourcing for its economic and social benefits?



9. Stakeholder Perceptions: How would you rate the level of awareness among stakeholders regarding the economic implications of sourcing construction materials locally?
10. How do you foresee the future trends and preferences regarding local material sourcing in the construction industry? Favourable

THE RESPONSE AND THE RII INDEX VALUES

A total of 120 respondents responded to the administered questionnaire and the breakdown is as follows.

Table 1: Respondents’ Response Chart

Serial No	Question	$\sum W$	A	N	RII
1	What are the primary cost factors influencing your decision to source construction materials locally? Material acquisition costs	497	5	120	0.83
2	What are the primary cost factors influencing your decision to source construction materials locally? Transportation expenses	499	5	120	0.83
3	How do you perceive the impact of market fluctuations on the cost of locally sourced construction materials?	506	5	120	0.84
4	Job Creation: To what extent do you believe sourcing construction materials locally contributes to job creation within the community?	497	5	120	0.83
5	Job Creation: Do you consider local material sourcing as a strategic approach to supporting the local workforce? Why or why not?	496	5	120	0.83
6	Environmental Impact: How important is environmental sustainability in your decision-making process when sourcing construction materials?	487	5	120	0.81
7	Stakeholder Perceptions: How would you describe the overall perception of local material sourcing among project stakeholders, including clients, investors, and the local community?	481	5	120	0.80
8	Stakeholder Perceptions: To what extent do you believe stakeholders prioritize local material sourcing for its economic and social benefits?	494	5	120	0.82
9	Stakeholder Perceptions: How would you rate the level of awareness among stakeholders regarding the economic implications of sourcing construction materials locally?	484	5	120	0.81
10	How do you foresee the future trends and preferences regarding local material sourcing in the construction industry? Favourable	478	5	120	0.80

The RII values provide a quantitative measure of the relative importance of different factors in the decision-making process related to sourcing construction materials locally. Higher RII values suggest higher perceived importance and interpretation of the RII index values are:

- i. Material Acquisition Costs (RII = 0.83): Respondents, on average, assigned a relatively high importance to material acquisition costs when deciding to source construction materials locally. The RII of 0.83 suggests that this factor is considered significant in the decision-making process.
- ii. Transportation Expenses (RII = 0.83): Similar to material acquisition costs, transportation expenses are also perceived as highly important by respondents, as indicated by the RII of 0.83.
- iii. Impact of Market Fluctuations (RII = 0.84): Respondents, on average, assigned a slightly higher importance (RII = 0.84) to the impact of market fluctuations on the cost of locally sourced construction materials. This suggests that they consider market dynamics as a significant factor.
- iv. Job Creation (RII = 0.83): The RII of 0.83 for job creation indicates that respondents believe sourcing construction materials locally contributes significantly to job creation within the community.
- v. Environmental Sustainability (RII = 0.81):



- Environmental sustainability, while still important, received a slightly lower average importance score (RII = 0.81) compared to other factors. This suggests that respondents consider environmental impact but may prioritize other factors more.
- vi. Stakeholder Perceptions (RII = 0.80 - 0.82):
Stakeholder perceptions are assessed through multiple questions, and the RII values ranging from 0.80 to 0.82 indicate that, on average, respondents perceive stakeholder views and priorities as moderately important in the decision-making process.
 - vii. Future Trends and Preferences (RII = 0.80):
Respondents, on average, assign a moderate level of importance (RII = 0.80) to forecasting future trends and preferences regarding local material sourcing in the construction industry.

DISCUSSION

The interpretation of the Relative Importance Index (RII) results from the survey on sourcing construction materials locally indicates the perceived significance of various factors in the decision-making process. Here's an overall interpretation based on the RII values:

- i. Material Acquisition Costs and Transportation Expenses (RII = 0.83 for both):
Respondents consider both material acquisition costs and transportation expenses to be highly important when deciding to source construction materials locally. These factors likely have a substantial influence on decision-making, reflecting a focus on cost-related considerations.
- ii. Impact of Market Fluctuations (RII = 0.84):
The impact of market fluctuations on the cost of locally sourced construction materials is perceived as slightly more important than material acquisition costs and transportation expenses. This suggests that respondents recognize the significance of market dynamics in their decision-making.
- iii. Job Creation (RII = 0.83):
Job creation is considered highly important in the decision to source construction materials locally. This result indicates that respondents recognize the social and economic benefits associated with supporting the local workforce through material sourcing.
- iv. Environmental Sustainability (RII = 0.81):
While still important, environmental sustainability receives a slightly lower importance score compared to the aforementioned factors. This suggests that respondents consider environmental impact but may prioritize economic and social factors more.
- v. Stakeholder Perceptions (RII = 0.80 - 0.82):
Stakeholder perceptions, including how stakeholders view local material sourcing and their priorities, are moderately important. The RII values ranging from 0.80 to 0.82 suggest that respondents recognize the influence of stakeholders in their decision-making.
- vi. Future Trends and Preferences (RII = 0.80):
The forecasting of future trends and preferences regarding local material sourcing in the construction industry is considered moderately important. This indicates that respondents acknowledge the need to anticipate and adapt to evolving industry trends.

CONCLUSION

The decision to source construction materials locally is multifaceted, with a clear emphasis on economic and social factors. The findings provide a foundation for strategic planning, allowing decision-makers to prioritize efforts in response to the factors perceived as most crucial by survey respondents. As the industry navigates challenges and opportunities, understanding the relative importance of these factors can inform effective decision-making and foster sustainable practices in the construction material sourcing process.

Material acquisition costs and transportation expenses emerge as critical considerations, both receiving high RII values of 0.83. The results emphasize the dominant role of economic factors in the decision-making process. The impact of market fluctuations on the cost of locally sourced construction materials is perceived as slightly more important (RII = 0.84), underlining the significance of staying attuned to market dynamics for decision-makers. Job creation, an indicator of the social impact of local material sourcing, is highly regarded with an RII of 0.83. This underscores the importance of supporting the local workforce as a key consideration in decision-making.

While still deemed important with an RII of 0.81, environmental sustainability receives a relatively lower priority compared to economic and social factors, suggesting a balanced consideration of environmental impact in decision-making. Stakeholder perceptions, encompassing views and priorities, are moderately important (RII = 0.80 - 0.82). This indicates an awareness among respondents of the impact of stakeholder opinions on the decision-



making process. Respondents assign a moderate importance level (RII = 0.80) to forecasting future trends and preferences in local material sourcing. This suggests a recognition of the need to adapt to evolving industry dynamics.

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