

Size Identify Local Culture for Developing Sustainability Construction in SEZ Likupang

Rusdi Usman Latief^a, Daisy Pangemanan^{a,*}

^a Department of Civil engineering, Universitas Hasanuddin, Makassar, 92119, Indonesia

Corresponding author: *rusdiusmanlatief@unhas.ac.id

Abstract— In the development of modern construction, the sustainable construction approach has grown in importance. Economic, environmental, and social factors have been identified as influencing its implementation. The use of the sustainable construction method is affected by several additional factors. This study aimed to determine how the Likupang SEZ's local cultural factors affected sustainable construction methods. The method used is a quantitative study with a sample of the Likupang SEZ in North Sulawesi. The results of this study indicate an influence of local cultural factors of 0.264 on the implementation of the sustainable construction approach in the Likupang SEZ. The results of this study also indicate that local cultural factors are important to consider in implementing sustainable construction. Things that focus on local culture in planting trees as materials for construction, local heritage, Work Culture, and the migrant community environment should be of particular concern in implementing a sustainable construction approach in the Likupang SEZ area. Cultural factors have an important role in ensuring development with this sustainable construction approach considering environmental, social, and economic factors as well as cultural factors as new factors identified as having an influence. This study concludes that it is very important to pay attention to local cultural factors that influence the implementation of a sustainable construction approach in the Likupang SEZ project in North Minahasa Regency, North Sulawesi, Indonesia.

Keywords—Local culture; sustainable construction; SEZ Likupang.

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I. INTRODUCTION

In the various infrastructures built, fundamental aspects such as the technical and social infrastructure should be paid attention. Technical infrastructure can be constructing facilities such as roads, bridges, dams, airports, and ports. While social infrastructures such as the construction of school buildings and hospitals. In its development, environmental issues have become a priority aspect. The cause is the issue of global warming, which has become a significant development and environmental problem. Thus, environmental issues become the basis of the development process. In this context, infrastructure development must consider the environment, society, and economy to ensure sustainability. In this context, the term sustainable building becomes the basis of development. An approach is urgently needed to achieve sustainable development that adopts three main pillars in infrastructure development, such as economic, environmental, and social disparities. Sustainable construction must have an approach to carry out the activities needed to create a physical facility that meets current and

future economic, social, and environmental goals. This concept allows the construction industry to realize sustainable development by considering social, economic, environmental, and cultural issues. Sustainable development aims to meet the needs of the present without compromising the ability of future generations to meet theirs. Sustainable construction must meet principles such as common goals, understanding, and action plans, compliance with security, safety, health, and sustainability standards, and reducing the use of resources, whether in the form of land, materials, water, natural resources, and human resources, reducing waste generation. , both physical and non-physical, reuse of resources that have been used previously, use of recycled resources, protection and management of the environment through conservation efforts, risk mitigation of safety, health, climate change, and disasters, orientation to the life cycle, orientation to the achievement of the desired quality, technological innovation for continuous improvement, institutional support, leadership, and management in the implementation.

In its implementation, it is necessary to have good management and involve various related parties as a form of a shared sense of responsibility in maintaining the ecosystem. The implementation of sustainable construction has, in fact, not been fully implemented by the guidelines contained in the Regulation of the Minister of Public Works and Public Housing. The application also varies according to regional conditions, the level of mutual understanding, sustainable construction by construction project stakeholders, the availability of various existing natural resources (materials and building materials), and human resources (construction experts, workers, technicians, etc.). Laboratory assistants, the availability of other resources such as heavy equipment, implementation methods, and adequate financial support. One of the focuses on development is the Special Economic Zone (SEZ). The SEZ was built to become a national area to support the industrial, economic, education, and tourism sectors. One of the SEZs built in North Sulawesi is the Tanjung Pulisan SEZ, Likupang. This SEZ is expected to become an international gateway in eastern Indonesia. The Tanjung Pulisan SEZ is 58.5 km from the capital city of North Sulawesi, Manado, and can be reached by road in approximately 1 hour and 47 minutes. An international import-export port also supports this special economic zone at Bitung City, 33.4 km away and reachable within 1 hour and 6 minutes.

In practice, sustainable construction requires an investigation of cultural factors as a factor identified according to the community's technical, environmental, social and cultural context. The absence of these factors has caused severe problems in its implementation at the regional and national levels. Several solutions have been created to try to solve the problem. The government, through the Ministry of Public Works and Public Housing has issued Ministerial Regulation Number 9 of 2021 concerning Guidelines for the Implementation of Sustainable Construction as a guide in the implementation of sustainable construction. However, its implementation is still constrained by the diverse context in society which is the subject of this sustainable construction implementation. Another solution that is tried to be studied in several studies is to model sustainable construction well. One of the studies made is the development of a framework in order to achieve sustainable construction [1]. In addition, the human resource factor is tried to be included as a determining factor in the success of sustainable construction management [2]. Human resources also include commitment and performance on various construction projects [3]. The factor that needs to be considered is the cultural factor that is tried to be included as an essential factor in environmental sustainability by taking into account the attitudes, company culture, and social responsibility factors [4]. A holistic solution is needed to build an appropriate model [5]. Sustainable construction is significant to consider local communities as part of the overall model [6], [7].

In this study, it is seen that there is a gap that arises because cultural factors have not been identified as one of the contributing factors in the implementation of sustainable construction, so it is essential to conduct a study as scientific proof that later can be used as a factor in a sustainable construction approach. The factors listed in several studies have shortcomings, such as being too simple and difficult to

implement in the field, even though sustainable construction involves many complex factors [8], [9]. On the other hand, in the Tanjung Pulisan Likupang SEZ area, cultural factors are a deciding factor as many local pearls of wisdom are continuously maintained and legalized through village ordinances and regional ordinances [10], [11]. This causes these models to be difficult to implement [12], [13].

Therefore, a comprehensive study is needed to explain the influence of cultural factors on implementing a sustainable construction approach. The novelty of this research is the study specifically on the cultural factors that influence sustainable construction. This cultural factor has never been analyzed as a factor influencing sustainable construction. This study analyzes the sustainable construction implemented in the Likupang SEZ built with sustainable tourism. This study aims to identify local cultural factors influencing the implementation of a sustainable construction concept. It is hoped that the results of this study will become a study to pay attention to cultural factors as one of the factors in a sustainable construction approach.

II. MATERIALS AND METHOD

The research method used is quantitative. This research analyzes and systematically investigates phenomena by collecting data that can be measured by performing statistical, mathematical, or computational techniques. This study uses statistical methods used to collect quantitative data. The variables of this study are independent, namely cultural factors and sustainable construction variables. Local culture variables focus on local culture in planting trees as materials for construction, local heritage (Values & Mindsets), Work Culture, and Migrant Community Environment.

Meanwhile, the sustainable construction variable focuses on a development approach to preserve nature to meet current needs while maintaining the availability of resources for future generations. This approach considers environmental, social, and economic factors. Sustainable construction is essential to maintain the sustainability and balance of natural ecosystems.

The data obtained through this research is called empirical or observed data with valid, reliable, and objective criteria. Valid shows the degree of accuracy between the data that researchers can collect. Finding out the validity of data is very difficult. Still, the first thing to do is test the reliability and objectivity of data because valid data must be reliable and objective. The researcher uses quantitative analysis with PLS tools to analyze the model and prove the factors that influence the sustainable construction approach [14]. PLS was chosen to be used by considering the amount of data analyzed, which is less than 100 respondent data. Thus, PLS is the right choice for calculating because it is more suitable and accurate for calculating data that amounts to less than 100 with a high level of accuracy.

The population in this study is every element of the construction project Stakeholder in the construction of the Likupang SEZ. Namely contractors, consultants, government, investors, academics, and the community. The sampling in this study was done by a stratified random sampling method. Stratified random sampling is a process of dividing the population into groups, selecting a simple random sample from each group, and combining them into a sample to

estimate the population parameters. The samples in this study are Service Providers (Contractors and Consultants) who have handled projects with a sustainable construction approach, the Government (District, Province, and Central), investors, academics, and the community (around SEZ and the general public).

The research location is in the Likupang Special Economic Zone (SEZ). The location selection was based on the consideration that the Likupang SEZ is one of the government’s priority super projects in developing the tourism and economic sectors in the Eastern Indonesia region. The Likupang SEZ was chosen because it is the only SEZ

different from other SEZs. The Likupang SEZ is the only SEZ built by the private sector and is an SEZ with a special super-priority tourism economic zone in Indonesia. The government is responsible for building and sustaining the infrastructure, while the private sector builds special economic zones. This is a particular and unique concern, so it is interesting to explore it further, especially in the architectural development approach that is applied. This study examines the implementation of the sustainable construction model and the strategy for sustainable construction in the Likupang SEZ area. See Figure 1.

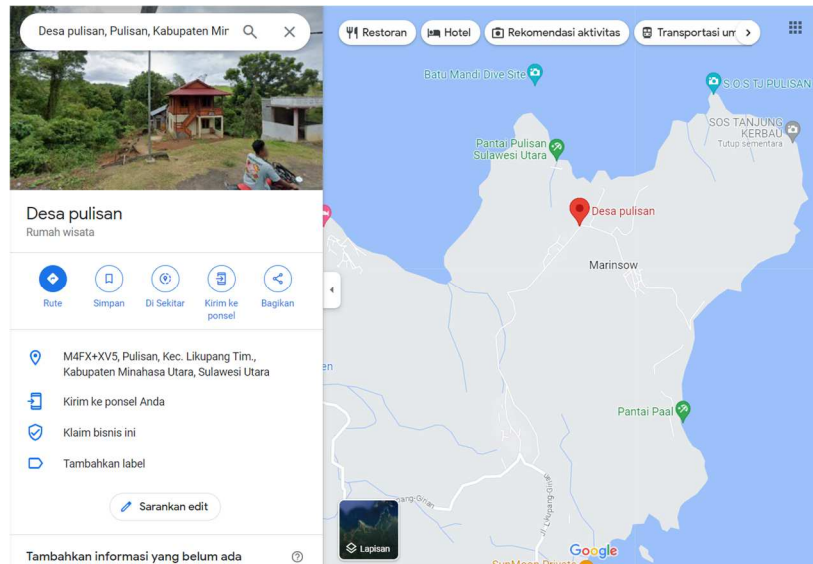


Fig. 1 Likupang SEZ Location Map

Currently, the construction site for the Likupang SEZ has begun with the construction of access road infrastructure to the SEZ and the provision of supporting utilities such as electricity, clean water, and telecommunications networks. The construction process was supposed to be in progress in 2020. However, due to the Covid-19 pandemic, construction was delayed to early 2021. The SEZ location, which is ready to be built for the initial stage, is 183 hectares, has passed the feasibility study process, and is currently under construction—waiting for the Presidential regulation document on the development of Special Economic Zones.

III. RESULTS AND DISCUSSION

A. Distribution of Respondents by Institution/Company

The results of the calculations performed on the respondents showed that 73.8% or 59 companies are private companies on an international, national and local scale. The remaining 12.5% are companies or government agencies, both national and local. The composition of the respondents also consisted of the public and academics from universities, which consisted of 8% and 3.75%, respectively. The total amount can be seen in Table 1 and Figure 2.

TABLE I
DISTRIBUTION OF RESPONDENTS BY AGENCY/COMPANY

No	Agency/Company	Amount
1	Government	10

No	Agency/Company	Amount
2	Private companies	59
3	Public	8
4	University	3
Total		80

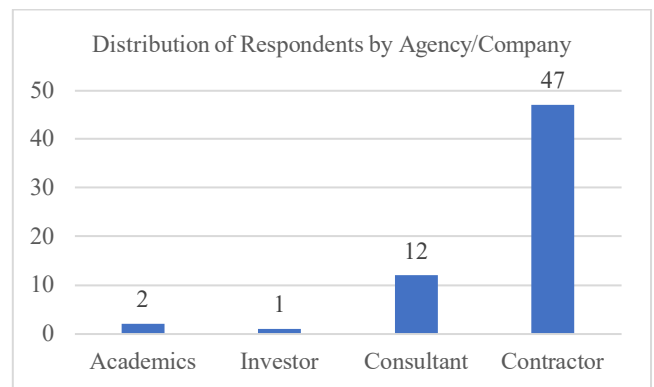


Fig. 2 Distribution of respondents by agency/company

B. Distribution of Respondents based on Company Qualifications

As a result of the analysis of the respondents, it was found that the respondents who worked for the companies concerned could be qualified using large, medium and small categories. This category was created to analyze the types of qualifications of companies involved in sustainable construction research in the Likupang SEZ. The results

showed that the respondents who worked for companies involved in the Likupang SEZ were 63 respondents and constituted 78.75% of the total respondents. Respondents who work in companies with the following categories: only one respondent who works with small companies, 29 respondents who work in companies with medium qualifications, and constitutes 46.03% of the total respondents who work in the companies involved. At the same time, the majority are respondents who work in large companies, as many as 33 people and 52.38%. See Table 2.

TABLE II
DISTRIBUTION OF RESPONDENTS BASED ON COMPANY QUALIFICATIONS

No	Company Qualification	Amount
1	Not Filling	17
2	Small	1
3	Intermediate	29
4	Large	33
Total		80

The remaining 17 respondents did not fill in but were respondents from community members, government, and academics, as many as 17 people or 21.25% of the total respondents, as many as 80. View figure 3.

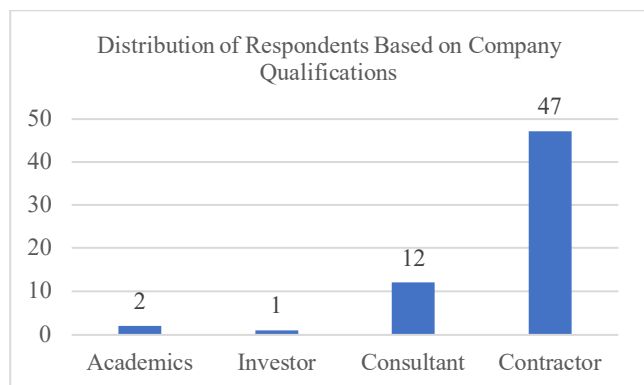


Fig. 3 Distribution of respondents based on company qualifications

C. Distribution of Respondents by Role as Stakeholders

The analysis of the recapitulation of respondents involved in this study found that the stakeholders involved can be seen in Table 3.

TABLE III
DISTRIBUTION OF RESPONDENTS BY STAKEHOLDER

No	Stakeholder	Amount
1	Academics	2
2	Investor	1
3	Consultant	12
4	Contractor	47
5	Public	7
6	Government	7
7	Owner	4
Total		80

Two stakeholders work as academics and seven people in the community. Most stakeholders are contractors, as many as 47 people or 58.75% of the total respondents involved in this study. The rest is spread to 1 investor, 12 consultants, seven government people, and four owners. See Figure 4.

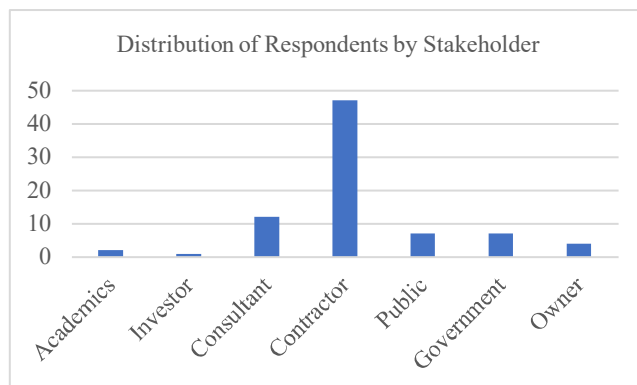


Fig. 4 Distribution of respondents by stakeholder

D. Calculation Results of Validity and Reliability

The results of the validity calculation were carried out using the Convergent Validity test (Average Variance Extracted (AVE)). This technique is to measure the Average Variance Extracted value with the measurement value (Average Variance Extracted (AVE)) must meet the value of each variable, which is ≥ 0.5 . see table 4.

TABLE IV
VALUE OF AVERAGE VARIANCE EXTRACTED

Variable	Cronbach's Alpha	rho_A	Composite Reliability	AVE
X (BU)	0.791	0.816	0.877	0.704
Y (SC)	0.831	0.832	0.887	0.664

Calculating the Average Variance Extracted value shows that all the calculated factors have a value greater than 0.5. The discriminant validity (Fornell Lacker criterion) calculation results are performed to determine the value of the discriminant validity (Fornell Lacker criterion), which is the correlation value between the variable itself and variables with other variables, cannot be less than other variables. The valid value must be greater than the value of the variable itself and the other variables. The results can be seen in Table 5.

TABLE V
CALCULATED DISCRIMINANT VALIDITY (FORNELL LACKER CRITERION)

Variable	X (BU)	Y (SC)
X (BU)	0.839	
Y (SC)	0.543	0.815

The calculation results show that the value of Counting Discriminant Validity (Fornell Lacker Criterion) has fulfilled the requirements of all the calculated variables. The validity value is also continued by calculating the value of Discriminant Validity (Cross Loading), which is a validity test between the indicator value that measures the variable itself and the value of other indicator variables. The validity value must be greater than that indicator with other variables. Conclude that cultural factors are proven to affect the implementation of sustainable construction.

The calculation results show that the discriminant validity (Cross Loading) has met the requirements. The results of Computing Reliability (Composite Reliability and Cronbach's Alpha) are the results of Computing Reliability (Composite Reliability and Cronbach's Alpha), defined as the instrument's efficacy in measuring the indicator value. Reliability Count Value (Composite Reliability and

Cronbach's Alpha) must be > 0.7. The calculation results can be seen in Table 6.

TABLE VI
VALUE OF COMPUTE RELIABILITY (COMPOSITE RELIABILITY AND CRONBACH'S ALPHA)

Variable	Cronbach's Alpha	rho_A	Composite Reliability	AVE
X (BU)	0.791	0.816	0.877	0.704
Y (SC)	0.831	0.832	0.887	0.664

The calculation results have shown that the calculated reliability value (Composite Reliability and Cronbach's Alpha) is greater than 0.7, so it can be said that the instrument is reliable and effective for use in research.

E. Model Evaluation: Inner Model Test (Path Coefficients)

The value of the Inner Model Test (Path Coefficients) is a value that shows the direction of the relationship between positive or negative variables. The results of this calculation show the direction of influence of each X variable on the Y variable (Continuous construction). The acceptance value is at zero. If it is greater than 0 to 1, it shows the direction of a positive influence, whereas if it is less than 0 to -1, it means it has a negative influence, see Table 7.

TABLE VII
VALUE OF INNER MODEL TEST (PATH COEFFICIENTS)

Variable	X (BU)	Y (SC)
X (BU)		0.264
Y (SC)		

The results of this study conclude the direction of the influence of the variables as follows: Variable X (Culture) has a POSITIVE effect on Y (Sustainability Construction). These results indicate that the cultural factor variable positively influences sustainable construction. Factors that have a positive influence will positively impact the implementation of sustainable construction projects in Likupang SEZ. This can be a critical success factor in sustainable construction. Factors that have a negative effect can also be seen in how they can hurt sustainable construction implemented in the Likupang SEZ.

F. Model Results: Inner Model Test (Significance T-STATISTIC)

The result of calculating the value of the Inner Model Test Evaluation (Significance T-STATISTIC) is a calculation result that shows the Significance value of a variable. This value can be seen in the results of the T-STATISTIC calculation, which shows how significant the influence of the variable-on-variable Y is sustainable construction. The acceptance value is the significance level used alpha = 0.05 or the T-Statistic value > 1.96 = SIGNIFICANT, see Table 8.

TABLE VII
MODEL CALCULATION RESULTS: INNER MODEL TEST (SIGNIFICANCE T-STATISTIC)

	Original Sample (O)	Sample mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
X					
(BUI-> Y(SC)	0.264	0.249	0.139	1.898	0.058

The same thing also happened to variable X (culture), which had a calculated value of 0.264, which means it has a positive effect on the sustainable construction variable but is not significant for variable Y because it only has a T-statistic value of 1.898. Thus, the cultural factor does have a positive effect on sustainable construction but does not significantly affect the sustainable construction factor. This cultural factor must still be considered when implementing sustainable construction in the Likupang SEZ.

The study's overall results provide an intriguing finding that the identified cultural factors positively influence sustainable construction. This is evident from the results of statistical calculations, which show a positive effect of 0.264. However, the effect does not seem significant because the results of the T-Statistic calculation only show the number 1,898. This figure is still less than the number of receipts of 1.96, or P Values show the number 0.058 and still does not meet the number less than alpha = 0.05. Thus, cultural factors still have not significantly influenced sustainable construction but have a positive role in the implementation of sustainable construction.

The findings of this study indicate that local cultural factors are important to consider in implementing sustainable construction. Things that focus on local culture in planting trees as materials for construction, local heritage (Values & Mindsets), Work Culture, and the migrant community environment should be of particular concern in implementing a sustainable construction approach in the Likupang SEZ area. This is to maintain the sustainability and balance of natural ecosystems. The development of the SEZ project in Likupang must pay attention to and preserve nature to meet current needs while maintaining the availability of resources for future generations. Thus, cultural factors have an important role in ensuring development with this sustainable construction approach considering environmental, social, and economic factors as well as cultural factors as new factors identified as having an influence.

The results of this study indicate that in the implementation of sustainable construction, it is not only materials that need to be considered, such as polymers [15] and management factors [16], and a more conference approach must be considered [17]. This shows the influence of a local culture that plays a role in implementing sustainable construction. The findings of another study state that the design process needs to pay attention to BIM-based designs [18], recyclable concrete materials [19], other material properties [20], and pay attention to the Physical-Chemical Processes factor in the materials used [21]. This shows that managing a sustainable construction approach is a comprehensive process involving all elements. A better approach is a holistic approach involving the community in the project area directly affected by the construction project. This certainly has an impact on the costs incurred in the construction of construction projects [22]. Another indicator that needs to be considered is projecting waste management which must be managed properly to remain environmentally friendly [23]. The development is expected to have no significant environmental impact in the area surrounding the project. The factor that must be the main concern is also the economic factor [24] which is the driving force for all project work, especially for the Likupang SEZ. The aim is to make tourism projects an

economic driver because of the economic impact of the project's construction. In constructing infrastructure projects with a sustainable construction approach, materials such as cement must still be considered to ensure project quality [25], [26]. This requires adequate and modern technology. One technology that can be applied to sustainable construction projects is nanotechnology and carbon to maximize the energy used [27], [28]. In addition, the landscape factor in the construction project area also affects the project [29], so it is very important to choose an effective material to produce a good quality, ecological and durable project [30]. Another thing that must be measured is the user's perception of sustainable construction to ensure understanding and perception so that a thorough evaluation of the construction project can be carried out [31]. This study succeeded in identifying cultural factors as one of the factors that influence projects with a sustainable construction approach.

IV. CONCLUSION

This study concludes that cultural factors influence the construction of projects with sustainable construction. The cultural factor is a new factor that we have successfully identified as one that has a role in implementing sustainable construction. These local cultural factors include the local culture in planting trees as materials for construction, local heritage (values & mindset), work culture, and the migrant community environment. This is very important to ensure the implementation can be successfully implemented. In this study, we concluded that cultural factors could be considered new to complement the previous factors, such as economic, environmental, and social factors. This study suggests that cultural factors can be implemented in a sustainable construction approach, especially in projects like the Likupang SEZ.

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REFERENCES

[1] Hammad, Ahmed WA, Ali Akbarnezhad, Peng Wu, Xiangyu Wang, and Assed Haddad., "Building Information Modelling-Based Framework to Contrast Conventional and Modular Construction Methods through Selected Sustainability Factors", *Journal of Cleaner Production*, 228: 1264–81, 2019, doi: 10.1016/j.jclepro.2019.04.150.

[2] Sahadi, Sahadi, and M. Agung Wibowo., "Ketepatan Klasifikasi Pada Pengelompokan Manajer Proyek Konstruksi Berdasarkan Faktor Pengembangan Sumber Daya Manusia Menggunakan Analisis Diskriminan", *Media Komunikasi Teknik Sipil*, 20, (2), 2015, doi:10.12777/mkts.20.2.119-124.

[3] Wibowo, M Agung., "Pengaruh Faktor Pengembangan Sumber Daya Manusia Terhadap Komitmen Dan Kinerja Pada Manajer Proyek Konstruksi", *Media Komunikasi Teknik Sipil*, 19, (1), 67–76, 2014, doi:10.14710/mkts.v19i1.7836.

[4] Ajibike, W.A., A.Q. Adeleke, F. Mohamad, J.A. Bamgbade, M.N.M. Nawi, and T.D. Moshood., "An Evaluation of Environmental Sustainability Performance via Attitudes, Social Responsibility, and Culture: A Mediated Analysis", *Environmental Challenges*, 4 (March): 100161, 2021, doi: 10.1016/j.envc.2021.100161.

[5] Solaimani, Sam, and Mohamad Sedighi., "Toward a Holistic View on Lean Sustainable Construction: A Literature Review", *Journal of Cleaner Production*, 248: 119213, 2020, doi: 10.1016/j.jclepro.2019.119213.

[6] Guo, Rui, Dong Chen, Daojing Zhou, Baoyin Liu, Hanchu Liu, Yannan Zhao, Yong Sun, and Jie Fan., "The Spatial Coupling Characteristics between the Construction of Qingzang National Park Cluster and the Sustainable Development of Local Communities", *Geography and Sustainability*, 2, (1), 1–11, 2021, doi: 10.1016/j.geosus.2021.01.001.

[7] Aigbavboa, Clinton, Ifije Ohiomah, and Thulisile Zwane., "Sustainable Construction Practices: 'A Lazy View' of Construction Professionals in the South Africa Construction Industry", *Energy Procedia*, 105: 3003–10, 2017, doi: 10.1016/j.egypro.2017.03.743.

[8] Atta, Islam, Emad S Bakhoum, and Mohamed M Marzouk., "Digitizing Material Passport for Sustainable Construction Projects Using BIM", *Journal of Building Engineering*, 43, 103233, 2021, doi: 10.1016/j.job.2021.103233.

[9] Curto, A, L Lanzoni, A M Tarantino, and M Viviani., "Shot-Earth for Sustainable Constructions", *Construction and Building Materials*, 239, 117775, 2020, doi:10.1016/j.conbuildmat.2019.117775.

[10] El-Mahdy, Deena, Hisham S Gabr, and Sherif Abdelmohsen., "SaltBlock as a 3D Printed Sustainable Construction Material in Hot Arid Climates." *Journal of Building Engineering*, 43: 103134, 2021, doi:10.1016/j.job.2021.103134.

[11] Fatourehchi, Dorsa, and Esmacil Zarghami., "Social Sustainability Assessment Framework for Managing Sustainable Construction in Residential Buildings", *Journal of Building Engineering*, 32: 101761, 2020, doi:10.1016/j.job.2020.101761.

[12] Hashmi, A Fuzail, M Shariq, and A Baqi., "An Investigation into Age-Dependent Strength, Elastic Modulus and Deflection of Low Calcium Fly Ash Concrete for Sustainable Construction", *Construction and Building Materials*, 283: 122772, 2021, doi:10.1016/j.conbuildmat.2021.122772.

[13] He, Zheng, and Huihua Chen., "Critical Factors for Practicing Sustainable Construction Projects in Environmentally Fragile Regions Based on Interpretive Structural Modeling and Cross-Impact Matrix Multiplication Applied to Classification: A Case Study in China", *Sustainable Cities and Society*, 74: 103238, 2021, doi: 10.1016/j.scs.2021.103238.

[14] Durdyev, Serdar, Syuhaida Ismail, Ali Ihtiyar, Nur Fatin Syazwani Abu Bakar, and Amos Darko., "A Partial Least Squares Structural Equation Modeling (PLS-SEM) of Barriers to Sustainable Construction in Malaysia", *Journal of Cleaner Production*, 204: 564–72, 2018, doi: 10.1016/j.jclepro.2018.08.304.

[15] Kiruthika, C, S Lavanya Prabha, and M Neelamegam., "Different Aspects of Polyester Polymer Concrete for Sustainable Construction", *Materials Today: Proceedings*, 43: 1622–25, 2021, doi: 10.1016/j.matpr.2020.09.766.

[16] Li, Keyao, and Sai On Cheung., "Alleviating Bias to Enhance Sustainable Construction Dispute Management", *Journal of Cleaner Production*, 249: 119311, 2020, doi: 10.1016/j.jclepro.2019.119311.

[17] Li, Yan, Yanfang Gu, and Chunlu Liu., "Prioritising Performance Indicators for Sustainable Construction and Development of University Campuses Using an Integrated Assessment Approach", *Journal of Cleaner Production*, 202: 959–68, 2018, doi: 10.1016/j.jclepro.2018.08.217.

[18] Liu, Hexu, Christoph Sydora, Mohammed Sadiq Altaf, SangHyeok Han, and Mohamed Al-Hussein., "Towards Sustainable Construction: BIM-Enabled Design and Planning of Roof Sheathing Installation for Prefabricated Buildings", *Journal of Cleaner Production*, 235: 1189–1201, 2019, doi: 10.1016/j.jclepro.2019.07.055.

[19] Mi, Renjie, Ganghua Pan, K M Liew, and Tong Kuang., "Utilizing Recycled Aggregate Concrete in Sustainable Construction for a Required Compressive Strength Ratio", *Journal of Cleaner Production*, 276: 124249, 2020, doi: 10.1016/j.jclepro.2020.124249.

[20] Muheise-Araalia, D, and S Pavia., "Properties of Unfired, Illitic-Clay Bricks for Sustainable Construction." *Construction and Building Materials*, 268: 121118, 2021, doi: 10.1016/j.conbuildmat.2020.121118.

[21] Mymrin, Vsevolod, Daniela E Pedrosa, Cleber L Pedrosa, Monica A Avanci, Paulo H B Rolim, Karina Q Carvalho, and Rodrigo E Catai., "Physical-Chemical Processes of Sustainable Construction Materials Structure Formation with Iron Ore Processing Tailings and Aluminum Anodizing Sludge", *Construction and Building Materials*, 298: 123698, 2021, doi: 10.1016/j.conbuildmat.2021.123698.

- [22] Nasereddin, Mohammad, and Andrew Price., "Addressing the Capital Cost Barrier to Sustainable Construction", *Developments in the Built Environment*, 7: 100049, 2021, doi: 10.1016/j.dibe.2021.100049.
- [23] Nithya, M, and Muthukumaran Ramasamy., "Sustainability in Construction Industry through Zero Waste Technology in India", *Materials Today: Proceedings*, 46: 849–51, 2021, doi: 10.1016/j.matpr.2020.12.851.
- [24] Ogunmakinde, Olabode Emmanuel, Temitope Egbelakin, and William Sher., "Contributions of the Circular Economy to the UN Sustainable Development Goals through Sustainable Construction", *Resources, Conservation and Recycling*, 178: 106023, 2022, doi: 10.1016/j.resconrec.2021.106023.
- [25] Nguyen, D. T., and V. T.A. Phan., "Engineering Properties of Soil Stabilized with Cement and Fly Ash for Sustainable Road Construction", *International Journal of Engineering, Transactions B: Applications*, Vol.34, No.12, 2665–71, 2021, doi: 10.5829/IJE.2021.34.12C.12.
- [26] Mousavi, S E., "Performance of Non-Fired Green Brick Containing Rice Husk as Sustainable Building Material", *International Journal of Engineering*, Vol.29, No.3, 306–12, 2016, doi: 10.5829/idosi.ije.2016.29.03c.04.
- [27] Oke, Ayodeji E, Clinton O A, and Kgothatso S., "Energy Savings and Sustainable Construction: Examining the Advantages of Nanotechnology", *Energy Procedia*, 142: 3839–43, 2017, doi: 10.1016/j.egypro.2017.12.285.
- [28] Ranjetha, K, U Johnson Alengaram, Ahmed Mahmoud A, S Karthick, W J Wan Z, and J Rao., "Towards Sustainable Construction through the Application of Low Carbon Footprint Products", *Materials Today: Proceedings*, 2021, doi: 10.1016/j.matpr.2021.10.275.
- [29] Ristić, Vladica, Marija M, Marina Nenković-Riznić, and Jelena Basarić., "Land-Use Evaluation for Sustainable Construction in a Protected Area: A Case of Sara Mountain National Park", *Journal of Environmental Management*, 206: 430–45, 2018, doi: 10.1016/j.jenvman.2017.09.080.
- [30] Safinia, Sina, Zamarad Al-Hinai, Hussin A M Yahia, and Mohammed F M Abushammala., "Sustainable Construction in Sultanate of Oman: Factors Effecting Materials Utilization", *Procedia Engineering*, 196: 980–87, 2017, doi: 10.1016/j.proeng.2017.08.039.
- [31] Yin, Belle Chua Lee, Richard Laing, Marianthi Leon, and Leslie Mabon., "An Evaluation of Sustainable Construction Perceptions and Practices in Singapore", *Sustainable Cities and Society*, 39: 613–20, 2018, doi: 10.1016/j.scs.2018.03.024.