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ttem_bih@yahoo.com, <http://www.ttem.ba>

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Seismic Vulnerability Assessment of Rural Areas: Case Study of the Vrutok Village and Recane Village in Gostivar, North Macedonia, Using Vulnerability Index Method

Jasemin Hodza Djafer

International Vision University, Faculty of Engineering and Architecture, Gostivar, North Macedonia

Abstract

Applying methodologies that enable faster evaluation of larger numbers of buildings are frequently applied approaches for seismic vulnerability assessment in larger urban areas. The same methods can also be useful in examining large numbers of existing buildings in rural areas. Considering the high seismic vulnerability of masonry buildings and the fact that there is large number of masonry buildings in rural areas, seismic risk assessment in these areas is particularly important. Masonry buildings in rural areas of the Republic of North Macedonia were mostly built in the late nineteenth and early twentieth century's or earlier. Where it is clearly seen that these buildings were built before the existence of seismic design regulations. The aim of the research is to examine the vulnerability of existing masonry buildings in the selected areas, in order to analyze the seismic risk. In the research, two villages were selected for analysis. In the article, the vulnerability index method was applied to evaluate the vulnerability of existing masonry buildings in the village Vrutok and village Recane in Gostivar, North Macedonia. As part of research, 49 buildings were evaluated, where 26 buildings are in the village Vrutok and 23 buildings in the village Recane.

Keywords: *Masonry buildings, Seismic risk, Vulnerability*

1. Introduction

There are old masonry buildings in North Macedonia that were built before seismic design regulations. Which in the event of an earthquake can experience major damage. The rehabilitation of the facilities requires large financial resources

that cannot be done all at once. Therefore, systematic planning for vulnerability assessment is needed to identify buildings or areas at higher risk (Nikolic et al., 2021).

Assessment of the vulnerability of buildings can be defined as their susceptibility to damage at certain earthquake intensity. The assessment aims to obtain the probability that a given class of buildings will exceed a certain damage level for a given earthquake scenario. Many seismic vulnerability assessments methods have been proposed in recent years. Seismic vulnerability assessment methods can be divided into two categories: empirical methods based on damage observation and analytical methods based on structural performance evaluation through analytical models (Lumantarna et al., 2014).

Seismic vulnerability assessment methods are used from individual buildings to large urban areas. To choose the appropriate method, the purpose of the research, the scope of work, the approach to obtaining information, available resources and computational effort should be considered (Vicente et al., 2011, pp.1067-1096). In the article two villages in the city of Gostivar were analyzed, and because of field research, 49 existing masonry buildings were identified. The reason for choosing these villages is that there are many existing masonry buildings in both villages. These buildings were built before the current seismic design regulations, and these buildings are used by many people today. To calculate the vulnerability of buildings, the vulnerability index, which is a hybrid method, was chosen. After calculating the vulnerability index, the average damage level of the buildings was calculated for four different scenarios of macro seismic intensity to evaluate possible damages.

2. Method

The seismic vulnerability index methodology, considered as a hybrid technique in literature, is based on the calculation of a vulnerability index resulting from the contribution of 14 parameters determined for each building examined. Table 1 presents all the parameters with classes (C_{vi}) and the weight factors proposed by Vicente and Ferreira (Vicente, 2008) (Ferreira et al., 2017).

$$I_{vf}^* = \sum_{i=1}^{14} C_{vi} \cdot P_{vi} \dots\dots\dots (1)$$

In Table 1, four vulnerability classes (C_{vi}), (A, B, C, D) are assigned to each parameter. Then, each parameter is associated with a weighting factor, which varies from 0.5 to 2.5. Depending on the contribution of the parameter to the building, less contribution is determined as lower value and more contribution as higher value. The vulnerability index I_{vf}^* can have values in the range from 0 to 675. For its ease of use, the value is normalized from 0 to 100. The lower the value of I_{vf}^* (normalized vulnerability index), the lower the seismic vulnerability of the considered building.

14 parameters are categorized into four groups (Vicente, 2008). The first group of parameters refers to the construction system of the building, such as type of material, quality of construction, soil conditions, number of floors, etc. A second group of parameters is considered for irregularities and interaction with other buildings. Irregularities in base and height, arrangement of openings and position of a building in a plot in relation to neighboring buildings. This group of parameters refers to inter-floor construction and roof. While the fourth group of parameters refers to non-constructive elements and the condition of the building (Speranza, 2003), (Ferreira, 2010), (Vicente et al., 2011, pp.1067-1096), (Ferreira et al., 2014, pp. 541-561).

For the operational application of the methodology, an analytical expression has been proposed that connects the hazard with a mean damage grade ($0 < \mu_D < 5$) of the damage distribution (discrete beta distribution) in relation to the value of seismic vulnerability.

$$\mu_D = 2.5 \left[1 + \tanh \left(\frac{I + 6.25 - 13.1}{Q} \right) \right] \\ 0 \leq \mu_D \leq 5, \dots\dots\dots (2)$$

Table1. Parameters for calculating the vulnerability index (Vicente et al., 2011)

Parameters	CLASS () A B C D	Weight factor	
		Vicente, 2008	Ferreira, 2017
Group 1. Structural building system			
P1.Type of resisting system	0 5 20 50	0.75	2.50
P2.Quality of resisting system	0 5 20 50	1.00	2.50
P3.Conventional strength	0 5 20 50	1.50	1.00
P4.Maximum distance between walls	0 5 20 50	0.50	0.50
P5.Number of floors	0 5 20 50	1.50	0.50
P6.Location and soil conditions	0 5 20 50	0.75	0.50
Group 2. Irregularities and interaction			
P7. Aggregate position and interaction	0 5 20 50	1.50	1.50
P8. Plan configuration	0 5 20 50	0.75	0.50
P9. Irregularity in elevation	0 5 20 50	0.75	0.50
P10. Wall façade openings and alignments	0 5 20 50	0.50	0.50
Group 3. Floor slabs and roofs			
P11.Horizontal diaphragms	0 5 20 50	0.75	0.75
P12. Roofing system	0 5 20 50	2.00	0.50
Group 4. Conservation state and other elements			
P13. Conservation state	0 5 20 50	1.00	1.00
P14. Non-structural elements	0 5 20 50	0.75	0.75

The value of the intermediate damage level, depends on three values, the vulnerability index (V), the macro seismic intensity (I), and the ductility factor (Q).

3. Seismic Vulnerability of the Village Vrutok and the Village of Recane

The villages chosen for the analysis of the vulnerability of the existing masonry building are the villages of Vrutok (figure 1) and the villages of Recane (figure 2). The village of Vrutok is in the southwestern part of the city of Gostivar with a population of 640 inhabitants (according to the 2021 census).



Figure 1. View of Vrutok village (URL 1)

The village of Recane is in the southwestern part of the city of Gostivar with a population of 683 inhabitants (according to the 2021 census) (URL2). In both villages there are masonry buildings built before the seismic design regulations, that is, before 1964.

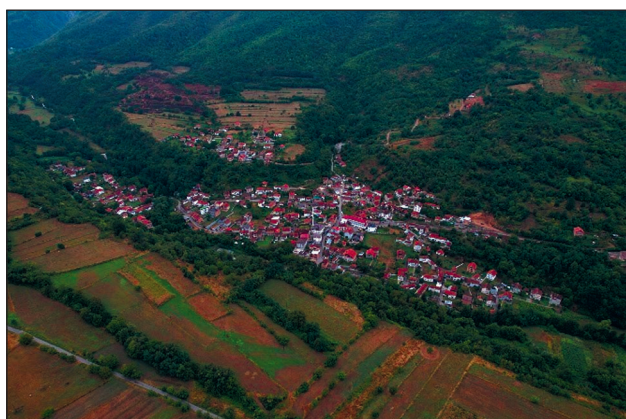


Figure 2. View of Recane village (URL 3)

In the village Vrutok, 26 existing masonry buildings have been identified (figure 3 – a; b), all of which are single-family houses. %15 of the buildings is with one floor, while %85 of the buildings is with two floors. %61.5 of the buildings are built of rubble stone or adobe, %38.5 of the buildings is built of simple stone or brick.



a) b)

Figure 3. a); b); Existing masonry buildings in Vrutok village (by author)

In the village of Recane, 23 existing masonry buildings have been identified (figure 4 – a, b), which are intended as single-family houses. %17.3 of the buildings are one-story while %82.7 of the buildings are two-story. %78.2 of the buildings are built of rubble stone or adobe, %21.8 of the buildings is built of simple stone or brick.



a) b)

Figure 4.a); b); Existing masonry buildings in Recane village (by author)

3.1. Results of the Seismic Vulnerability of the Village of Vrutok and the Village of Recane

In the study, field studies were carried out to determine the masonry buildings in both villages. The data collected from field research was done by filling in a form where the information needed for the calculation of the vulnerability index I_{vj}^* was collected, in relation to the data for 14 parameters shown in table 1. The assessment of seismic vulnerability is made through the calculation of

the vulnerability index I_{vf}^* , which is calculated by equation (2). The vulnerability index I_{vf}^* is normalized from 0 to 100. In the calculation of the vulnerability index the weighting factors provided by Vicente and Ferreira were used. In figure 5 and figure 6 is show percentage representation of buildings according to normalized vulnerability index I_{vf}^* . Spatial distribution of normalized vulnerability index I_{vf}^* is shown in figures 7 and 8.

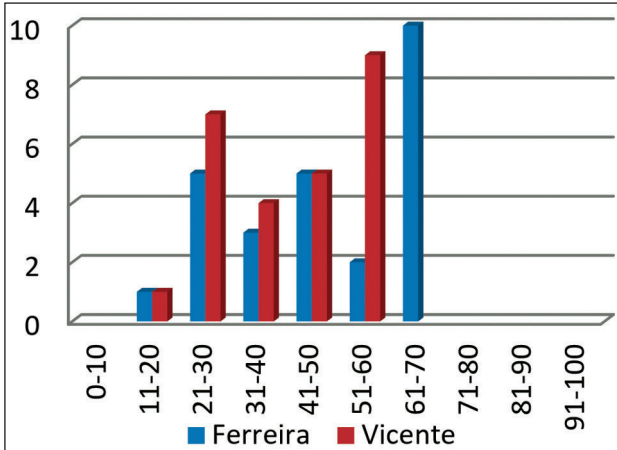


Figure 5. Percentage representation of buildings according I_{vf}^* -Vrutok (by author)

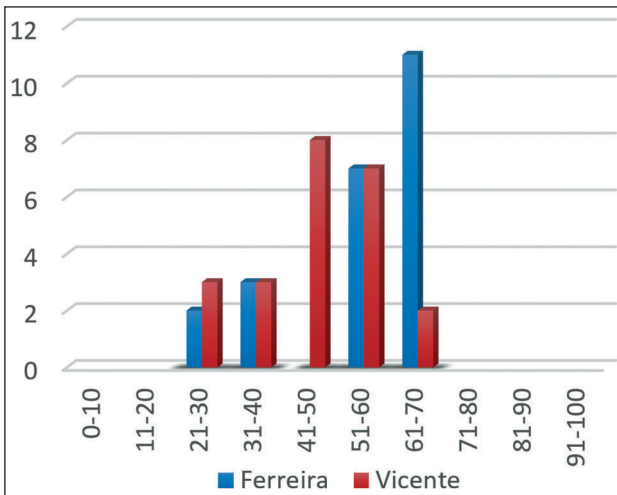
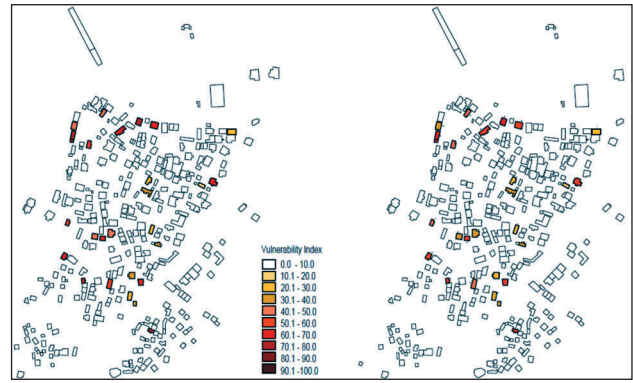


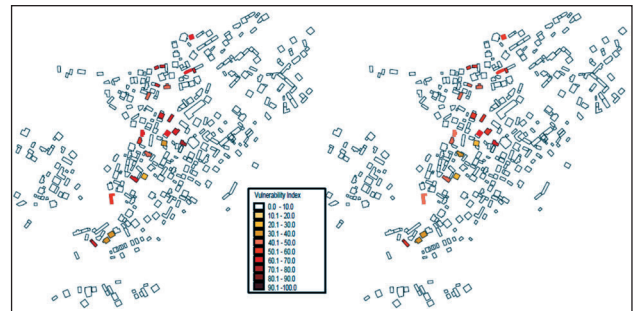
Figure 6. Percentage representation of buildings according to I_{vf}^* -Recane (by author)



a) Ferreira

b) Vicente

Figure 7. Spatial distribution of I_{vf}^* for existing state of the buildings in Vrutok; (by author)



a) Ferreira

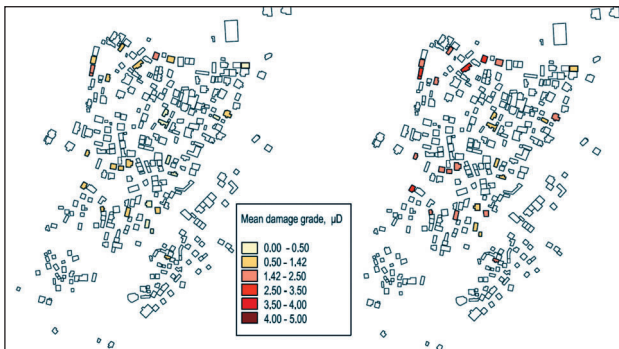
b) Vicente

Figure 8. Spatial distribution of I_{vf}^* for existing state of the buildings in Recane (by author)

3.2. Distribution and Scenarios of Damages

With the calculated values of the vulnerability index, using equation (3), the mean damage grade (μ_D), was calculated, for 4 different scenarios of macro seismic intensities (between VI and IX degrees according to the MCS scale) (Bernardini et al., 2007). A graphical representation of the spatial distribution of the average damage level at earthquake intensities from $I=6$ to $I=9$ degrees for buildings in village Vrutok is shown in figures 9 and 10.

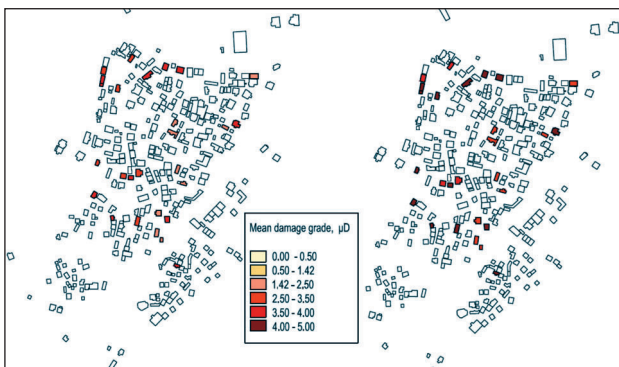
Figures 11 and 12 show statistical data on the percentage representation of the mean damage grade achieved for each of four separate scenarios in village Vrutok.



a) I=6

b) I=7

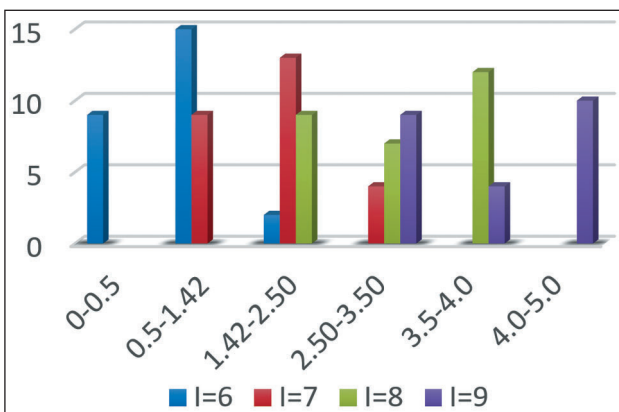
Figure 9. Spatial distribution of the mean damage grade (μ_D) for different earthquake intensities in the buildings in Vrutok (by author)



a) I=8

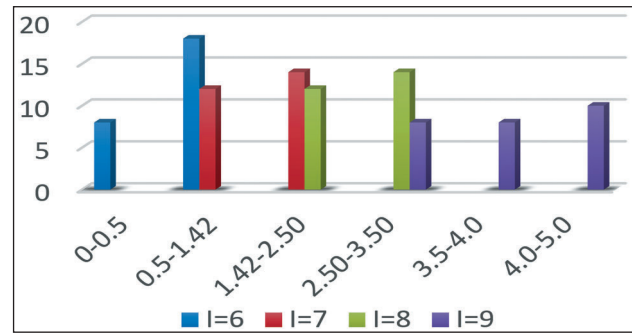
b) I=9

Figure 10. Spatial distribution of the mean damage grade (μ_D) for different earthquake intensities in the buildings in Vrutok (by author)



Ferreira

Figure 11. Percentage distribution of buildings according to the mean damage grade (μ_D) of buildings in Vrutok (by author)

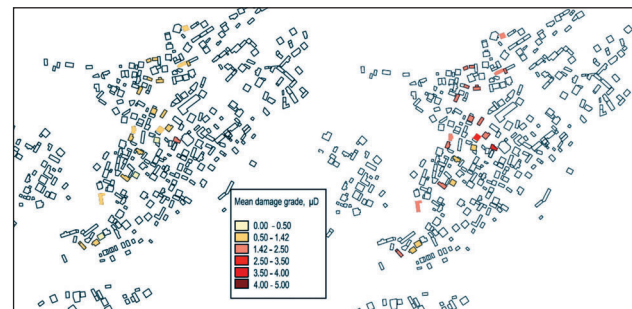


Vicente

Figure 12. Percentage distribution of buildings according to the mean damage grade (μ_D) of buildings in Vrutok (by author)

A graphical representation of the spatial distribution of the average damage level at earthquake intensities from I=6 to I=9 degrees for buildings in village Recane is shown in figures 13 and 14.

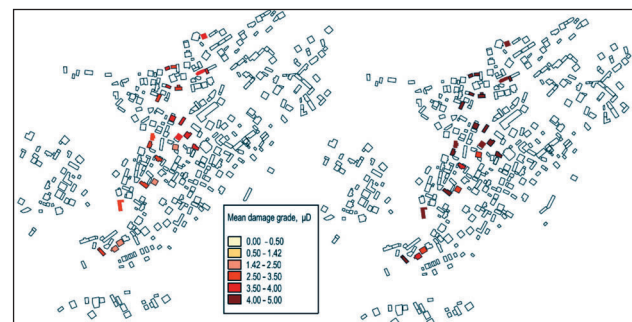
Figures 15 and 16 show statistical data on the percentage representation of the mean damage grade achieved for each of four separate scenarios in village Recane.



a) I=6

b) I=7

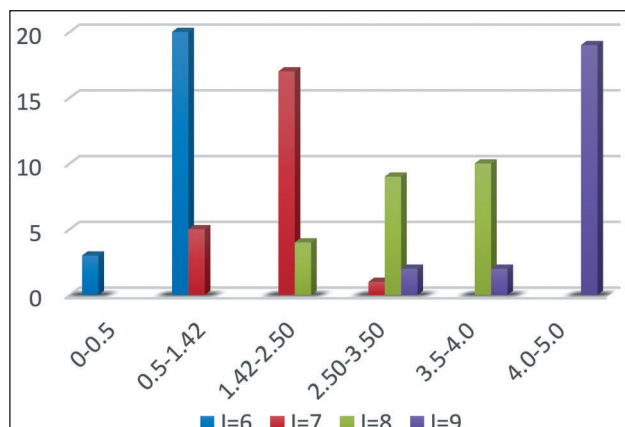
Figure 13. Spatial distribution of the mean damage grade (μ_D) for different earthquake intensities in the buildings in Recane (by author)



a) I=8

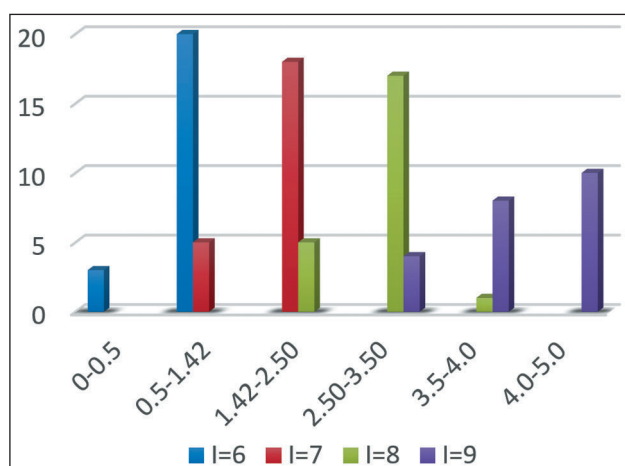
b) I=9

Figure 14. Spatial distribution of the mean damage grade (μ_D) for different earthquake intensities in the buildings in Recane (by author)



Ferreira

Figure 15. Percentage distribution of buildings according to the mean damage grade (μ_D) of buildings in Recane (by author)



b) Vicente

Figure 16. Percentage distribution of buildings according to the mean damage grade (μ_D) of buildings in Recane (by author)

According to the obtained results, it is noted that for the lower intensities of the earthquake (VI and VII degree), the buildings in the village of Vrutok are valued with scores from 0 to 2.5, in the village of Recane, on other hand, for intensity (VI and VII degrees), the buildings are valued with from 0 to 2.5.

For the higher intensities of the earthquake (VIII and IX degrees) in both villages, the buildings are rated 2.5 to 5.

The vulnerability curves for the current state of the buildings in the village of Vrutok and village of Recane is shown in figures 17 and 18.

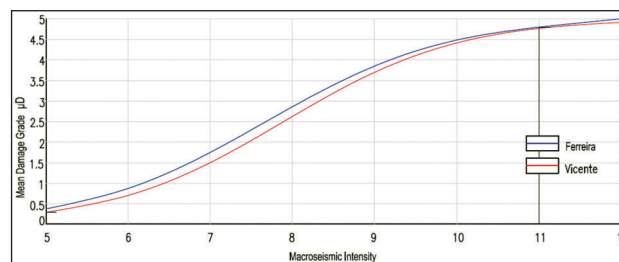


Figure 17. Vulnerability curves for the current state of the buildings in the village of Vrutok

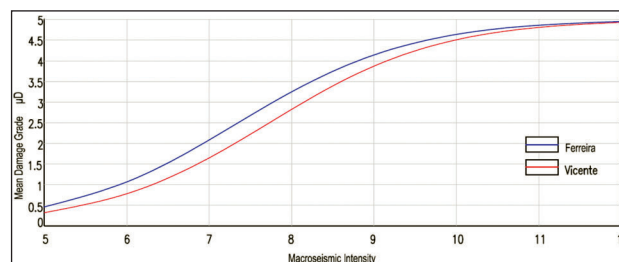


Figure 18. Vulnerability curves for the current state of the buildings in the village of Recane

The necessary data for a total of 49 buildings were collected and the seismic vulnerability index method was applied. Although the examined region is a medium-level seismic hazard zone, the results showed that significant damage could occur in a possible medium and high-level earthquake. According to the results obtained, while a large part of the buildings would be significantly damaged in a possible earthquake of magnitude 7, a large part of the buildings would be destroyed or would be rendered unusable in a possible earthquake of magnitude 8 and 9.

4. Conclusion and discussion

Masonry buildings occupy a large place in the current building stock of the Republic of North Macedonia. The percentage of existing masonry buildings in rural areas is even higher. Apart from the fact that many people live in them, these buildings have architectural value, which should be preserved.

In rural areas, lack of maintenance and inadequate rehabilitation of buildings increase the seismic vulnerability of buildings. To prevent any kind of loss caused by earthquakes, the vulnerability of existing buildings must be assessed, and the necessary reinforcement works must be carried out. To achieve this, studies based on macro seismic approaches are important for examining the existing building stock.

Within the scope of the research, a total of 49 masonry buildings in both villages were evaluated using the vulnerability index method (VIM). Thus, results were obtained regarding the vulnerability of buildings in the event of a possible earthquake in the region and risky buildings in both villages were identified. According to the results obtained, in a possible magnitude 8 earthquake, 70% of the buildings in the village of Vrutok could be severely damaged or destroyed, while in the village of Recane, 82% of the buildings could be severely damaged or destroyed. In a possible magnitude 9 earthquake, all masonry structures in both villages could be severely damaged and destroyed. With the obtained results, a picture of the state of vulnerability of the investigated buildings or areas is obtained. After defining buildings or areas that have high risk in even of a future earthquake, it is possible to make decisions about further steps to improve the situation.

The next steps after this research can be as follows:

- Investigating the buildings at risk in more detail with the obtained database, performing non-linear numerical analyses.
- Comparing the results to be obtained with these analyses with the existing results, thus improving the VIM methodology.
- Creating risk scenarios with the general results obtained.
- Using all the obtained data to prepare improvement projects with local governments.

References

1. Bernardini, A., Giovanazzi, S., Lagomarsino, S., Parodi, S., Bernardini, S. G. A., (2007). "Vulnerabilità e previsione di danno a scala territoriale secondo una metodologia macrosismica coerente con la scala EMS-98", *em In Proceedings of the 12th Conference of the Italian National Association of Earthquake Engineering - ANIDIS*.
2. Ferreira, T.M., (2010) "Seismic Vulnerability Assessment of Old Urban Centres - Case Study of the Old City Centre of Seixal, Portugal". Thesis of the post-graduate course in Rehabilitation of the Built Heritage, Faculty of Engineering of the University of Porto, Portugal.
3. Ferreira, T., Vicente, R., Varum, H. (2014). "Seismic vulnerability assessment of masonry façade walls: Development, application and validation of a new scoring method." *Structural engineering & mechanics*. Vol.50. No.5, pp. 541-561. DOI: 10.12989/sem.2014.50.4.541
4. Ferreira, T.M., Mario, R., Vicente, R. (2017). "Vulnerability Assessment of the Old City Centre of Horta Portugal: Calibration and Application of a Scoring Method". *16th World Conference on Earthquake Engineering, 16WCEE 2017, Santiago, Chile*.
5. Lumantarna, E., Lam, N, Tsang, H, Wilson, J., Gad, E., and Goldsworthy, H. (2014). "Review of Methodologies for Seismic Vulnerability Assessment of Buildings". *Australian Earthquake Engineering Society 2014 Conference*, Nov. 21–23 Lorne, Australia.
6. Nikolic, Z., Runjic, L., Ostojic Skomrlj, N., Benvenuti, E. (2021). "Seismic Vulnerability Assessment of Historical Masonry Buildings in Croatian Coastal Area". *Applied Sciences*, Vol. 11 No. 13, pp. 5997. <https://doi.org/10.3390/app11135997>
7. Speranza, E. (2003). "An Integrated Method for the Assessment of the Seismic Vulnerability of Historic Buildings". *Phd thesis, University of Bath, UK*.
8. Vicente, R.D. (2008). "Estrategias e metodologias para intervenções de reabilitação urbana Avaliação da vulnerabilidade e do risco sísmico do edificado de Baixa de Coimbra".
9. Vicente, R., Parodi, S., Lagomarsino, S., Varum, H., Mendes Silva, J. A. R. (2011). "Seismic vulnerability and risk assessment: case study of the historic city centre of Coimbra, Portugal", *Bull Earthquake Eng.* No. 9, pp.1067–1096. DOI 10.1007/s10518-010-9233-3.
10. URL-1. Available at: https://en.wikipedia.org/wiki/Recane,_Gostivar#/media/File:Поглед_на_Речане.jpg (accessed 15 June.2024)
11. URL-2. Total resident population of the Republic of North Macedonia by ethnic affiliation, by settlement, Census 2021. Available at: PxWeb (accessed 15 June. 2024)
12. URL-3. Available at: https://en.wikipedia.org/wiki/Vrutok#/media/File:Поглед_на_Вруток.jpg (accessed 15 June.2024)
13. URL-3. https://en.wikipedia.org/wiki/Vrutok#/media/File:Поглед_на_Вруток.jpg Last Accessed:15.06.2024

Corresponding Author
Jasemin Hodza Djafer,
International Vision University,
Faculty of Engineering and Architecture,
Gostivar,
North Macedonia,
E-mail: yasemin.hoca@vision.edu.mk

Analysis of irregularities in public procurement in the Republic of Serbia – OLS and GLM model

Darko Anackov

Bulgarian – Serbian Center, Vranje, Republic of Serbia

Abstract

This paper analyzes the financial control of public procurement in the public sector of the Republic of Serbia. The research covers the period from 2008 to 2023. Two regression models were applied in the study: OLS regression and the GLM model. The subject of this research includes identifying irregularities that occurred during the financial control of public procurement in the period from 2008 to 2023, according to available annual audit reports in the Republic of Serbia. The results show a significant impact of irregularities on the total value of observed irregularities, indicating the need for improved procedures and controls. In other words, the results highlight a significant impact of irregularities on the total value of detected issues, directing attention to the need for enhancing procedures and controls. The analysis suggests that irregularities arise due to various factors, such as insufficient transparency, lack of training and education for procurement staff, inadequate implementation of the legislative framework, and the complexity of the procedures themselves.

Keywords: irregularities, public procurement, audit, reports

Introduction

The procurement of goods, works, and services from private suppliers is the focus of public procurement, a branch of public administration. This category includes long-term investments such as new schools, roads, ports, and technology, as well as needs that require swift implementation, such as fuel, office supplies, airline tickets, and vehicles. The public sector accounts for about 15 to 20 percent of GDP, indicating a significant level of government involvement in providing goods and services to the broader public in most countries. The government's ability to perform its duties, as well as

the timeliness, quality, and accessibility of the goods and services it provides to the public, largely depend on its procurement practices (Sanchez, 2013).

Given that control is a fundamental managerial role, it is indisputable that financial control of public procurement is of crucial importance for the progress of modern society. Therefore, the significance of this research is clear. The urgent procurement of products, works, and services for public needs has drawn greater attention due to the complex epidemiological scenario worldwide. The shortage of certain types of goods worsened due to restrictions imposed by numerous countries around the world during the pandemic, and corruption increased, necessitating additional budget expenditures. In light of these facts, we can say that good public administration is characterized by a well-coordinated system for the procurement of goods and services and the timely execution of fiscal oversight over its implementation (Kikavets & Tsaregradskaya, 2023). Every time a government agency or another organization uses taxpayers' money to purchase products, services, or construction works, this practice is called public procurement (World Bank, 2003). As we can see in Chart 1, public procurement plays a very important role in society, which necessitates its study.

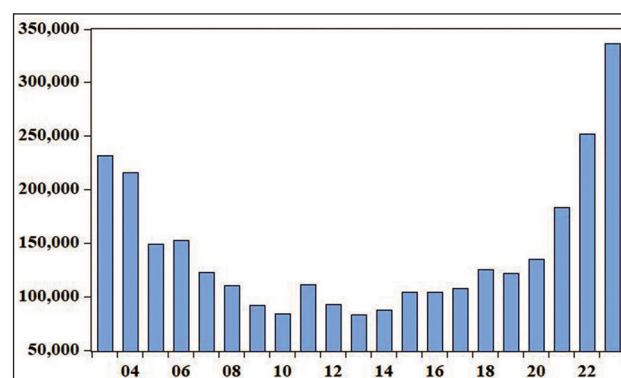


Chart 1. Number of public procurement contracts concluded

Source: Author's Work

As the chart shows the concluded public procurement contracts from 2003 to 2023, several significant trends and exceptions can be observed. The highest number of concluded contracts was recorded in 2023, with 336,116 contracts. This represents a significant increase compared to previous years, especially compared to 2022, when the number of contracts was 251,949. This growth may indicate increased activity or efficiency in the public procurement process. The lowest number of concluded contracts was recorded in 2013, with 83,121 contracts. In other words, this year stands out as the period with the least activity in public procurement during the observed period. Overall, the number of concluded public procurement contracts shows fluctuations over the years, with several periods of significant decreases (e.g., between 2008 and 2010) and periods of growth, particularly from 2020 onwards. These changes may result from various economic, political, and regulatory factors that have influenced the public procurement process.

The subject of this research includes identifying irregularities that occurred during the financial control of public procurement in the period from 2008 to 2023, according to available audit reports in the Republic of Serbia. The contribution of this research lies in the absence of a unified scientific methodology and the insufficient exploration of the financial control system in public procurement.

Literature Review

Gunzynov et al. (2022) in their research provide a detailed description of various aspects of the legal framework regulating public procurement in Russia, Mongolia, and the People's Republic of China. The priorities of state policy in the area of public procurement in these countries are presented in the study, which also highlights the key provisions of financial control and anti-corruption measures. The study aimed to compare and contrast the Russian Federation, the People's Republic of China, and Mongolia in terms of legal regulation of financial control and the implementation of accountability measures for procurement-related crimes. The findings of the study indicate that the legislation in China, Russia, and Mongolia strengthens anti-corruption measures

for crimes related to procurement. Despite numerous legal restrictions, corruption-related crimes involving procurement activities frequently occur. Aboelazm (2018) notes that there is a lack of research within the academic literature that compares the approaches of different countries to public procurement reforms aimed at increasing fiscal oversight and public expenditure accountability, particularly in Africa. At the same time, this type of research can shed light on how public procurement in Africa ensures value for money. This paper uses a comparative approach to highlight some experiences of countries in public procurement processes. The research findings suggest that public procurement systems and PFM (Public Financial Management) in the countries from the case study are influenced by three key elements: government structures, economic variables, and socio-cultural values. Sirotkina & Pavlovskaya (2016) in their research observe that the legislation regulating public procurement in Russia must include public control systems. The structure of public oversight enables the transparency of public procurement, despite the challenges associated with the pace of reforms in this area. There is insufficient use of the potential provided by legislation for establishing public oversight. Although it is likely that public initiatives will expand and that interaction between the public and government bodies regarding budget expenditures will begin, the impact of the public on public procurement authorities remains inadequate, especially in light of the uncertain economic situation. Training and informational support for participants in the public procurement market, along with efforts to dispel the widespread belief among Russian entrepreneurs that competitive procedures are predetermined, are all reasonable extensions of reforms aimed at improving the transparency of government contracts. Kozłowski & Czaplicka-Kozłowska (2020) suggest that the focus of the research is on considering the steps involved in selecting the best bidder under public procurement law. Before delving into the specifics of the problem, this article focused on legislative solutions, the number of amendments to these solutions since the first law was passed in 1994, and the actual implications for managing public financial resources. Research results from specific districts were used to make these diagnoses. The

basic assumption of the study is that local financial resources can be better managed and protected by eliminating excessive debt and implementing public procurement laws. The study concluded with proposals for improving the public procurement process and addressing the issues with existing legislative solutions. Amankwa & Tetteh (2022) observe that addressing agency difficulties has become crucial, as procurement practices in many developing countries are not transparent. Through the lens of agency theory, this research examines the management of public finances and procurement in the context of a comparative study of Asian and African countries. Using a descriptive case study approach, the research relies on data sets from 100 African and Asian countries over the period from 2002 to 2018. The study found that Asian countries had more efficient public financial management (PFM) outcomes compared to African countries, as their procurement methods were more aligned with international standards. Thai (2017) notes that in theory and practice, public procurement is dynamic and constantly changing. Rapid technological advancements, an explosion in product choices, increasing environmental awareness, and the complexity of regional and international trade agreements have contributed to the ever-changing dynamics for procurement professionals. As a result, there is significant diversity in organizational structures, procedures, and methodologies within the public procurement system in a federal system. The attempt of the public procurement system to maximize competition is largely influenced by economic or market conditions. Research findings indicate that good procurement rules and regulations are crucial for the effective functioning of the public procurement system. Allowing procurement staff from different departments to directly interact with suppliers or to make unilateral decisions about procurement sources is an example of decentralization. Fazekas & Cingolani (2017) aimed to deepen the understanding of these phenomena by investigating the potential role of rules on political fundraising in reducing cases of corruption in public procurement. To this end, they use new indicators to assess the likelihood of high levels of institutionalized corruption, using aggregated official microdata on nearly 3 million contracts awarded

in 29 European countries between 2009 and 2014. The research results indicate that no statistically significant harmful effect was found from adding political finance restrictions on corruption risks in public procurement in difference-in-differences and panel regression models among countries. Surprisingly, most models show a favorable effect. To a large extent, the relationship found is consistent with the norms regulating political fundraising. Measuring implementation rather than legislation, allowing more time for regulatory impact, or addressing institutional dependencies are some of the remaining barriers preventing a final judgment on the effectiveness of party finance restrictions in limiting corruption. Obura (2023) suggests that procurement planning provides government agencies with the opportunity to evaluate the entire procurement process, which should lead to better decisions that help initiate projects related to the purchase of goods, works, and services. The interaction between the procurement function and broader public financial management is crucial for budget preparation and execution, as it is a critical aspect of management and the public financial system. Research results suggest that organizations should collaborate on everything from planning to payment, as well as on important supply contracts for commonly used goods, and act as an advisory board on procurement-related issues to prevent organizations from facing large unpaid bills at the end of the fiscal year.

Data Set and Research Methodology

In this study, data from annual audit reports in the Republic of Serbia were used (State audit institution, 2008-2023). The data cover the period from 2008 to 2023. This research focuses on analyzing the impact of different types of irregularities that occur in the public procurement process and how they affect the overall value of identified irregularities according to available annual audit reports. To conduct this analysis, two statistical models were employed. First, the Ordinary Least Squares (OLS) model was used. This model is a classical approach to linear regression and was employed to examine the direct effects of certain irregularities on the total value of observed irregularities. The application of the OLS model helps

to estimate the relationship between variables and provides insights into how irregularities impact the overall value (Newman et al., 2010). Since the OLS model has limitations in providing adequate and comprehensive information, the Generalized Linear Model (GLM) was used to confirm or refute the results obtained. This model allows for flexible analysis of different types of data and can be adapted to the specific needs of the research. Additionally, the GLM will be used to assess the degree of impact of various types of irregularities on the total value of observed irregularities, taking into account various factors that may influence the results (Moran et al., 2007).

Table 1 provides a display of descriptive statistics covering irregularities in public procurement, highlighting significant differences among various types of observed irregularities. The findings offer insights into these irregularities, facilitating a deeper understanding. The highest average value of 2.08 and median of 2.36 are recorded for irregularities related to contracts concluded without conducting a procurement procedure, non-compliance with legal requirements, or inadequate application of procedure types. This variable shows a high standard deviation of 0.76, indicating significant variability. Additionally, high kurtosis values of 6.06 and negative skewness of -1.99 are observed. On the other

Table 1. Descriptive Statistics of Observed Variables

Variables	Mean	Median	Std Dev	Kurtosis	Skewenes	Jarque - Bera
Irregularities in Public Procurement: Inadequate Pricing Evaluation, Commencement Without Approval, and Other Failures	1.672014	1.961151	0.702365	4.976677	-1.905594	11.52025
Irregularities in Public Procurement: Procurements Conducted Without Planned Funds, Acceptance of Defective Bids, and Absence of Procedure Regulation Document	1.023177	1.345325	0.711634	1.762715	-0.538476	1.681689
Irregularities in Public Procurement: Contracts Concluded Without Conducted Procedures, Failure to Meet Legal Requirements, and Inadequate Application of Procedure Types	2.084601	2.364714	0.761304	6.055775	-1.997118	15.80730
Irregularities in Public Procurement: Observed Irregularities in Advertising and Conducting Procurement Procedures	2.080173	2.367957	0.680549	6.906265	-2.164922	21.25403
Irregularities in Public Procurement: Changes to Contract Terms Without Decision and Irregularities in Contract Execution	1.233172	1.819745	0.855443	1.494929	-0.566416	2.217841
Irregularities in Public Procurement: Estimated Value Not Determined in the Prescribed Manner	0.971346	1.560184	0.822770	1.174482	-0.394531	2.471961
Other Irregularities	1.744544	2.327577	1.092238	2.101513	-1.034714	3.181133

hand, irregularities concerning procurement procedures where irregularities were observed in advertising or conducting procedures show similar patterns. The average value is 2.08, the median is 2.37, and the standard deviation is 0.68. Kurtosis of 6.91 and skewness of -2.16 suggest a very peaked and negatively skewed distribution. This category has the highest Jarque-Bera test value of 21.25, indicating a significant deviation from normal distribution. For irregularities related to procurements conducted without allocated funds or failure to reject bids with significant defects, the lowest average values of 1.02 and a median of 1.35 are observed. This type of irregularity exhibits lower kurtosis values of 1.76 and mild negative skewness of -0.54, suggesting a relatively more uniform distribution compared to other categories. Furthermore, the highest standard deviation of 1.09 is observed in the category of other irregularities, indicating considerable variability within this group. High negative skewness of -1.03 suggests the presence of low-value irregularities.

The following graph illustrates the share of public procurement in the Gross Domestic Product (GDP).

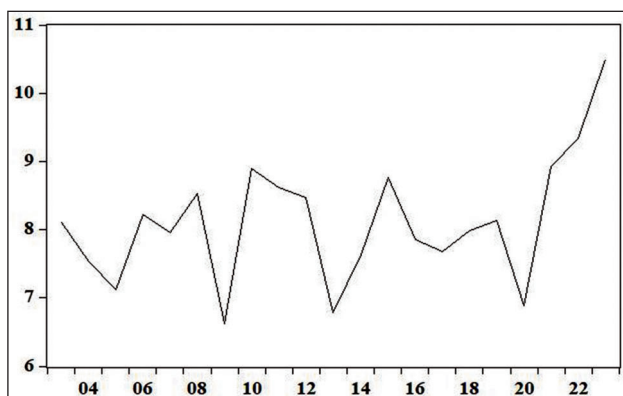


Chart 2. Participation of public procurement in GDP

Source: Author's Work

Chart 2 shows data representing the share of public procurement in the Gross Domestic Product (GDP) for each year from 2003 to 2023. It can be observed that the highest share of public procurement in GDP was recorded in 2023 at 10.5%, while the lowest share was in 2009 at 6.62%. These data highlight variations in the scope of public procurement over the past 20 years, which may be useful for analyzing trends and economic activity.

The following graph presents the total value of concluded public procurement contracts by year.

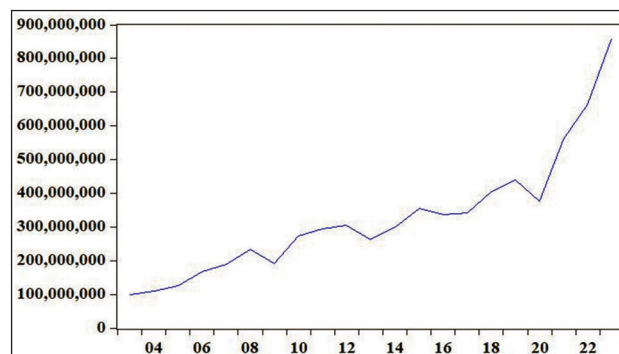


Chart 3. Total value of contracts

Source: Author's Work

In Chart 3, we see the total number and value of public procurement contracts (in thousands of dinars) for each year from 2003 to 2023. The chart illustrates significant variability in the volume of public procurements over this period, with smaller numbers and values in the earlier years and a substantial increase in the later years.

Empirical Research

Common issues in behavioral research include multicollinearity, missing values, and insufficient sample size. The probability that a theoretically valid predictor will be excluded from the regression model as an insignificant variable increases when multicollinearity is high ($VIF \geq 10$) in Ordinary Least Squares (OLS) regression (Farahani et al., 2010). In other words, the results obtained from applying OLS regression are unreliable in such situations due to the increase in the standard error of the estimated coefficients (Field, 2000).

Since the VIF values are below 10 for all variables describing different types of irregularities in public procurement, we can conclude that multicollinearity is not present in these data.

OLS Regression. In this segment of the research, an analysis was conducted on the impact of different types of irregularities occurring in the public procurement process on the total value of detected irregularities using the OLS regression model. By implementing this model, the study aimed to identify significant effects of each type of irregularity on the total value of irregularities.

Table 2. VIF Test

Variables	VIF
Irregularities in Public Procurement: Inadequate Price Evaluation, Start Violations Without Consent, and Other Omissions	3.003425
Irregularities in Public Procurement: Procurements Conducted Without Planned Funds, Acceptance of Deficient Bids, and Absence of Procedure Regulation Act	1.478194
Irregularities in Public Procurement: Contracts Concluded Without Conducting a Procedure, Failure to Meet Legal Requirements, and Inadequate Application of Procedure Type	2.426503
Irregularities in Public Procurement: Observed Irregularities in Advertising and Conducting Procurement Procedures	2.039991
Irregularities in Public Procurement: Amendments to Contractual Conditions Without Decision and Irregularities in Contract Execution	5.02719
Irregularities in Public Procurement: Estimated Value Not Determined According to Prescribed Method	1.08558
Other Irregularities	4.815352

Table 3. OLS Regression Results

Variables	OLS regression
Irregularities in Public Procurement: Inadequate Price Evaluation, Commencement Violations Without Consent, and Other Deficiencies	-1.266080***
Irregularities in Public Procurement: Conducted Procurements Without Planned Funds, Acceptance of Offers with Deficiencies, and Absence of Procedure Regulation Act	-1.773516**
Irregularities in Public Procurement: Contracts Concluded Without Conducted Procedure, Non-Fulfillment of Legal Conditions, and Inadequate Application of Procedure Type	0.211209***
Irregularities in Public Procurement: Observed Irregularities in Advertising and Conducting Procurement Procedures	1.428155***
Irregularities in Public Procurement: Modification of Contractual Conditions Without Decision and Irregularities in Contract Execution	2.120990***
Irregularities in Public Procurement: Estimated Value Not Determined in Prescribed Manner	-0.434454**
Other Irregularities	-0.614029***

Based on the tabular presentation, we can observe that irregularities related to the disruption of the start of public procurement, such as not obtaining the consent of the competent authority or inadequate evaluation of price as a crucial element of the contract, have a significant negative impact on the total value of irregularities with a coefficient of -1.266080. If there were a reduction in these irregularities, it could significantly contribute to decreasing the overall value of observed irregularities. Additionally, procurements conducted without allocated funds or acceptance of offers with

essential deficiencies also had a significant negative impact of -1.773516. Eliminating or reducing these irregularities could significantly contribute to the reduction of the total value of irregularities.

We also observe that the variable related to procurements where the estimated value was not determined as required has a coefficient of -0.434454. This suggests that improvements in the valuation process could contribute to a reduction in the overall value of irregularities. Finally, the results indicate that the variable for other irregularities showed a significant negative impact of

-0.614029, suggesting that reducing or eliminating these irregularities could positively affect the decrease in the total value of irregularities.

On the other hand, the variable related to procurement contracts concluded without the proper procurement process, or without meeting the legal requirements or conditions for applying the procedure, had a positive impact, with a coefficient of 0.211209. This suggests that an increase in these types of irregularities could contribute to an increase in the total value of irregularities. Additionally, the variable related to procurements where irregularities were observed in the advertising or implementation processes also had a significant positive impact, with a coefficient of 1.428155. This indicates the need for improvements in advertising procedures and the implementation of procurement processes. Finally, contracts where changes to the contract terms were made during execution without a formal decision or where there were irregularities in contract performance showed the most significant positive impact, with a coefficient of 2.120990. In other words, these irregularities have the most significant positive impact on the total value of detected irregularities, highlighting the urgent need to address these issues.

The obtained research results and their analysis revealed that different types of irregularities also have varying impacts on the total value of irregu-

larities in public procurement. Notably, irregularities related to changes in contract terms during execution have the most significant positive impact, while irregularities involving procurements conducted without planned funds have the most significant negative impact. These results highlight the paramount importance of adhering to and implementing legal requirements. Additionally, the public procurement plan must be adequately formulated, and areas within the procurement process that need to be prioritized for improvement should be identified to reduce the total value of irregularities and enhance the efficiency and transparency of public procurement. The findings are consistent with research conducted by Asenso-Boakye & Etse (2014) and Abeku (2021).

Generalized Linear Model (GLM). In this research, the Generalized Linear Model (GLM) was also used to further investigate the impact of different types of irregularities in the public procurement process on the total value of observed irregularities. The analysis includes not only the coefficients and standard errors but also the z-statistics for each type of irregularity, providing a better understanding of the significance and direction of the impact of these irregularities.

Based on the tabular display, we can observe that the results indicate that irregularities related

Table 4. GLM Regression Results for Public Procurement Irregularities

Variables	GLM regression (Standard error)	z-statistic
Irregularities in Public Procurement: Inadequate Valuation of Price, Violation of Commencement Without Approval, and Other Omissions	-1.266080 (0.220867)**	-5.732324
Irregularities in Public Procurement: Procured Contracts Without Planned Funds, Acceptance of Defective Offers, and Lack of Procedure Regulation Act	-1.773516 (0.279318)***	-6.349454
Irregularities in Public Procurement: Concluded Contracts Without Conducted Procedure, Non-Compliance With Legal Conditions, and Inadequate Application of Procedure Type	-0.211209 (0.105784)***	-1.996596
Irregularities in Public Procurement: Observed Irregularities in Advertising and Procurement Procedures	1.428155 (0.343118)***	4.162279
Irregularities in Public Procurement: Modification of Contractual Conditions Without Decision and Irregularities in Contract Execution	2.120990 (0.611190)***	3.470263
Irregularities in Public Procurement: Estimated Value Not Determined as Required	-0.434454 (0.637273)***	-0.681740
Other Irregularities	-0.614029 (0.103869)*	3.470263

to the violation of the commencement of public procurement, without obtaining the approval of the competent authority or inadequate valuation of price as a critical element of the contract, show a significant negative impact, with a coefficient of -1.266080 and a z-statistic of -5.732324. We can conclude that these irregularities have a significant negative association with the total value of irregularities, suggesting that a reduction in this type of irregularity could potentially decrease the overall value of observed irregularities.

Examining the next variable, which relates to procurements where no separate funds were planned or where offers containing significant deficiencies were not rejected, reveals the most significant negative impact, with a coefficient of -1.773516 and a z-statistic of -6.349454. This indicates a substantial negative association between these irregularities and the total value of irregularities. Further, the variable concerning procurements where the estimated value was not determined in the prescribed manner shows a coefficient of -0.434454 and a z-statistic of -0.681740. Although this shows less significance compared to the previous irregularities, this variable still demonstrates a negative impact on the total value of irregularities. Additionally, the variable related to other irregularities shows a significant negative impact, with a coefficient of -0.614029 and a z-statistic of 3.470263. This suggests that reducing or eliminating this type of irregularity could positively affect the reduction of the total value of irregularities. Finally, the results for procurements where irregularities were observed in advertising or conducting procurement procedures showed a positive and significant impact, with a coefficient of 1.428155 and a z-statistic of 4.162279. These results collectively indicate a need to improve the procedures for advertising and conducting procurement processes to reduce the total value of irregularities.

Examining the variable related to contracts where changes were made to contractual terms during execution without a decision on the contract modification or where there were irregularities in contract execution, we observe that this has the most significant positive impact, with a coefficient of 2.120990 and a z-statistic of 3.470263. These irregularities have the largest positive impact on the total value of irregularities, indicating

that addressing these issues is crucial for reducing or eliminating them. For the variable concerning contracts where the procurement process was not conducted, legal conditions were not met, or the conditions for applying the type of procedure were not fulfilled, the coefficient is -0.211209 with a z-statistic of -1.996596. Since these results are less significant compared to the previous irregularities, this variable suggests a slight negative impact on the total value of irregularities.

In conclusion, the results suggest that different types of irregularities in the public procurement process have very different impacts on the total value of observed irregularities. The most significant impacts are related to irregularities involving procurements carried out without planned funds and changes in contract terms during execution. In other words, these irregularities have the most significant effect on the overall value of irregularities. These findings highlight critical areas in the public procurement process that should be prioritized for improvement to reduce the total value of irregularities and enhance the efficiency and transparency of public procurement. There is a particular need to focus on the implementation of legislative frameworks and rules for conducting public procurements, which is consistent with the research conducted by Lukhele (2022) and Quashie (2019).

Conclusion

The research results provide a deeper insight into the impact of various irregularities in the public procurement process on the total value of observed irregularities. The analysis revealed that irregularities related to the breach of the commencement of public procurement, irregularities without obtaining the approval of the competent authority, or inadequate valuation of price as a crucial contract element have a significant negative impact on the overall value of irregularities. Reducing or eliminating these irregularities would contribute to a decrease in the total value of detected irregularities. Additionally, procurements carried out without planned funds or where offers containing significant defects were not rejected also had a statistically significant negative impact. Moreover, irregularities related to procurements where the estimated value was not determined in

the prescribed manner showed a smaller but still statistically significant negative impact, indicating that improving the valuation process would further reduce the total value of irregularities. On the other hand, irregularities related to concluding procurement contracts without conducting a public procurement procedure, irregularities in advertising and procurement processes, as well as irregularities concerning changes in contract terms during execution, suggest a statistically significant positive impact on the total value of identified irregularities. Particularly noteworthy are the irregularities related to changes in contract terms during execution, which have the highest positive impact on the total value of observed irregularities, highlighting an urgent need to address this issue.

The application of the additional model, Generalized Linear Model (GLM), further confirmed the significance and direction of the impact of various irregularities on the total value of irregularities. The obtained results clearly indicate the key areas in the public procurement process that should be prioritized and given attention to improve and thus reduce the total value of irregularities, ultimately enhancing the efficiency and transparency of public procurement.

The limitations of the research pertain to several general aspects. Firstly, the quality of available data may vary, which can significantly impact the accuracy and reliability of the results. Additionally, the methodology used in this study, while adequate for basic analysis, could be improved by applying other statistical techniques and models, which would provide deeper insights and results. Thirdly, although the data used in this study are relevant, future research could benefit from utilizing a more diverse range of data and increasing their volume to obtain more comprehensive and extensive results and information. Finally, future research should focus on improving the quality and availability of data and applying analytical approaches to achieve more robust conclusions and recommendations. Furthermore, incorporating certain economic, political, and social factors into the analysis could provide a better understanding of the context in which public procurement occurs, how these factors influence irregularities, and the consequences of these factors.

References

1. Abeku, E. E. (2021), *The consequences of public procurement and its associated irregularities in Ghana*, *AARMS–Academic and Applied Research in Military and Public Management Science*, 20(1), 55-65.
2. Aboelazm, K. S. (2018), *Reforming public procurement and public financial management in Africa: Dynamics and influences*, *Journal of Advances in Management Research*.
3. Amankwa, M. O., & Tetteh, E. K. (2022), *Comparative analysis of public procurement and public financial management within Asia and Africa*, *International Journal of Procurement Management*, 15(2), 133-159.
4. Asenso-Boakyee, M., & Etse, D. (2014), *Irregularities in Ghana's Public Sector Procurement and Their Possible Reinforcers: A Study of the Auditor General's Report*, *International Journal of Economics, Commerce and Management*, United Kingdom, 2(2).
5. Farahani, H. A., Rahiminezhad, A., & Same, L. (2010), *A comparison of partial least squares (PLS) and ordinary least squares (OLS) regressions in predicting of couples mental health based on their communicational patterns*, *Procedia-Social and Behavioral Sciences*, 5, 1459-1463.
6. Fazekas, M., & Cingolani, L. (2017), *Breaking the cycle? How (not) to use political finance regulations to counter public procurement corruption*, *Slavonic and East European Review*, 95(1), 76-116.
7. Field, A. (2000), *Discovering statistics using SPSS for windows*, London: Sage.
8. Gunzynov, Z. P., Dondokova, M. Y., Konovalova, Z. A., Myakhanova, A. N., & Sinkov, D. V. (2022), *Legal regulation of procurement activities in Russia, China and Mongolia: some aspects of financial control and anti-corruption*, *Юридический вестник Самарского университета Juridical Journal of Samara University*, 8(1), 88-96.
9. Kikavets, V. V., & Tsaregradskaya, Y. K. (2023), *Financial control as a factor of effective public procurement management*, *Law Enforcement Review*, vol. 7, no. 2, pp. 85–95. Available at: DOI 10.52468/2542-1514.2023.7(2).85-95 (accessed 15.08.2024.)
10. Kozłowski, A. J., & Czaplicka-Kozłowska, I. Z. (2020), *Security of Public Financial Resources and the Public Procurement Procedure—Analysis of Transparency and Characteristics of Procedures Based on Research*, *Internal Security*, 12, 129-143.

11. Lukhele, T. M. (2022), *Content analysis and ranking of irregularities in public sector construction procurement in South Africa*, *International Journal of Construction Supply Chain Management*.
12. Moran, J. L., Solomon, P. J., Peisach, A. R., & Martin, J. (2007), *New models for old questions: generalized linear models for cost prediction*, *Journal of evaluation in clinical practice*, 13(3), 381-389.
13. Newman, D., Newman, I., & Salzman, J. (2010), *Comparing OLS and HLM models and the questions they answer: Potential concerns for type VI errors*, *Multiple Linear Regression Viewpoints*, 36(1), 1-8.
14. Obura, C. O. (2023), *Procurement planning: The principle of sound balance between procurement control and achieving value for money*, *International Academic Journal of Procurement and Supply Chain Management*, Volume 3, Issue 2, pp. 19-27.
15. Quashie, M. K. (2019), *Causes and Costs of Procurement Irregularities in Ghana's District Assemblies*, *International Journal of Law and Society*, 2(4), 58.
16. Sanchez, A. (2013), *The role of Procurement*, In *The International Handbook of Public Financial Management* (pp. 312-335), London: Palgrave Macmillan UK.
17. Sirotkina, N., & Pavlovskaya, S. (2016), *Public control as a mechanism of the openness of public procurement: Case of Russia*, *Global encyclopedia of public administration, public policy, and governance*, Cham: Springer.
18. Thai, K. V. (2017), *International public procurement: Concepts and practices*. In *International handbook of public procurement* (pp. 1-24), Routledge.
19. World Bank. (2003a), *Public Procurement Act of Ghana - Country procurement assessment report*, Washington D.C. - The World Bank. Report No. 29055. (4). Available at: <http://documents.worldbank.org/curated/en/2003/06/3582686/ghana-countryprocurement-assessment-report-vol-4-5-annex-8-public-procurement-act>. (accessed 04.07.2024).
20. Državna revizorska institucija. *Godišnji izveštaj o radu*. Available at: <https://www.dri.rs/godisnji-izvestaji-o-radu> (accessed 04.07.2024).

Corresponding Author
 Darko Anackov,
 Bulgarian – Serbian Center,
 Vranje,
 Republic of Serbia,
 E-mail: darko.anackov911@gmail.com

Sustainable Architectural Design in Palestine: A Review in the Context of Globalization and Green Imperialism

Hussein Alragabi,

Palestine Polytechnic University, Hebron, Palestine

Abstract

This article addresses sustainable design challenges in Palestinian architecture, especially in the context of globalization and green imperialism. It emphasizes the need for an approach that emphasizes local needs and cultural values, away from the effects of global capitalism. It examines the deep-rooted links between local Palestinian architecture and sustainability and discusses how contemporary sustainable design can be harmonized with this heritage.

1. Introduction

Vernacular Palestinian architecture is deeply related to the concept of sustainability as a symbol of local identity, cultural heritage, and environmental adaptation. It evolved over the centuries, adapting to local conditions and environmental constraints.

Although sustainability is often seen as a modern concept, its roots are deeper in historically and culturally rich regions such as Palestine. Local architecture is notable for adapting to the local environment, using available resources efficiently, and reflecting local culture (Thwainy, 2008). However, globalization has led to the rapid replacement of these traditional structures with modern ones. The modern buildings constructed in Palestine over the last few decades have often been designed following global standards and therefore use of materials and design principles that are not suitable for the local climate and environmental conditions (Alragabi, 2024). This has posed serious threats not only to environmental sustainability but also to cultural sustainability.

Sustainability means meeting the needs of the present without jeopardizing the ability of future

generations to meet their own needs (World Commission on Environment and Development, 1987). Behind this simple definition there are three pillars: of environmental, economic and social sustainability. Environmental sustainability is concerned with conserving natural resources, reducing pollution and preserving ecosystems (Baker, 2006). Economic sustainability aims for economic growth without depleting natural resources, ensuring social justice and equitable distribution of resources (Baker, 2006). Social sustainability, on the other hand, focuses on increasing social welfare, reducing inequalities, protecting human rights and ensuring that everyone has access to basic needs (McKenzie, 2004).

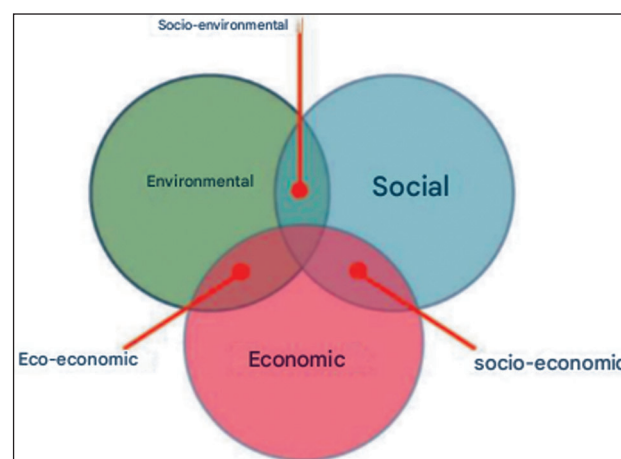


Figure 1. Dimensions of Sustainability, H. Alragabi

Where these three pillars come together, green architecture emerges. Green architecture is an approach that integrates sustainability principles into architectural design (McLennan, 2004). This approach aims to increase energy efficiency, conserve natural resources, and create a healthier and more sustainable built environment (Edwards & Turrent, 2000).

The history of sustainable architecture in Palestine has been shaped by buildings built in harmony with the local conditions of this region (Eg. Battir village, (Kudumovic, 2023)). Traditional buildings were constructed with local materials, and their design was developed with environmental factors in mind. For example, the use of local stone ensures the thermal balance of the buildings and makes it possible to keep the interiors cool (Ragette, 2003). Such buildings are also equipped with water-saving systems; rainwater harvesting systems and efficient use of natural water resources are common practices in traditional Palestinian buildings (Ragette, 2003).

However, with globalization, modern and contemporary often environmentally maladaptive structures have replaced these traditional buildings. This paper examines how sustainable architecture in Palestine has evolved in this context and how the concept of sustainability has been reshaped under global influences (Alragabi, 2024).

2. Sustainable Design in Palestinian Traditional Architecture

Palestinian vernacular architecture has demonstrated sustainability principles, adapting to the soil and climate over thousands of years. This architecture emphasizes both harmony with the environment and cultural identity. This includes:

- Climate-compatible design: Traditional ventilation systems such as thick stone walls, shaded courtyards, wind towers (Malkaf), Al Mashrabiya windows, and natural cooling were utilized to provide natural cooling and minimize energy con-

sumption. It has also been expressed using passive design strategies in traditional building design (Fathi, 1986; Al-Khawli, 1975).

- Wise Use of Local Resources: Stone, adobe, wood, and other natural materials were used in a manner consistent with sustainable building methods and low environmental impact (Amiry & Tamari, 1989; Hadid, 2002).

- Cultural Integration: Traditional Palestinian homes reflect social values such as privacy, a sense of community, and the value placed on family life (Amiry & Tamari, 1989). The use of courtyards served as social gathering spaces that brought families together and provided coolness to the interior spaces (Haddad, 2010).



Figure 2. Hirbawi Complex in the Old City of Hebron- showing local architecture, H. Alragabi

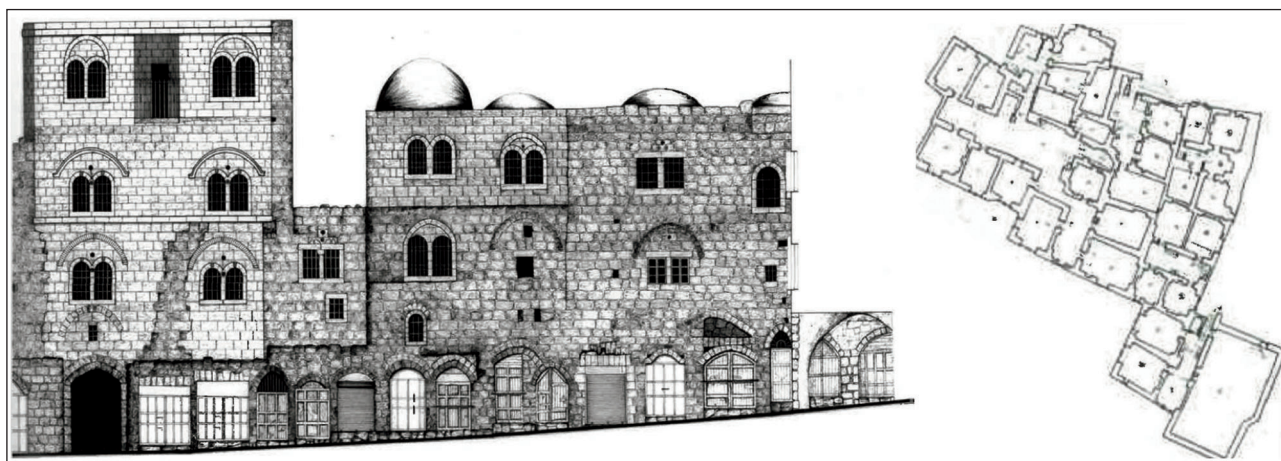


Figure 3. Plan and Eastern Facade of Al Harbawi Complex in Al Aqaba Neighborhood, The Old Book of Hebron (HRC, 2008)

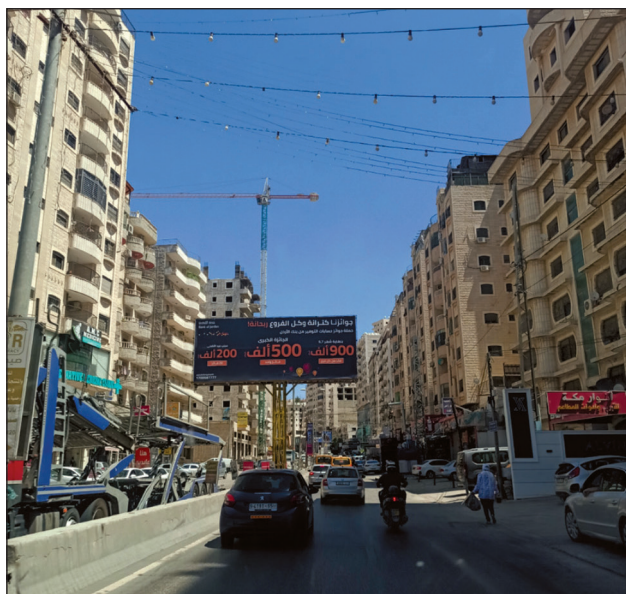


Figure 4. Kufr Akab – Al-Quds/Jerusalem Region, H. Alragabi

3. Contemporary Palestinian Architecture: Challenges to Sustainability

The new understanding of sustainability is based on the idea that contemporary architecture should adapt to local conditions. However, many modern buildings constructed in Palestine ignore the local environmental conditions and appear as projects with low energy efficiency, consuming water resources, and not responding adequately to the needs of local communities.

Since the late 20th century, Palestinian architecture has undergone significant changes due to the impact of globalization, new building materials and technologies. These changes have created major challenges for sustainable design in Palestine:

- Impact of Globalization: The proliferation of architectural styles and building materials worldwide threatens Palestine's unique cultural identity and sustainable construction practices (Salman, 2018; Asquith & Vellinga, 2006).

- Green Imperialism: The tendency of developed countries to impose sustainability solutions on developing countries, often ignoring local needs and values (Shaqir, 2023; Hamouchene, 2023).

- Limited Resources: Palestine faces ongoing occupation, resource constraints and economic barriers (Tuffaha, 2009; PCBS, 2010; Isaac, 2010). These factors make it difficult to implement sustainable building projects.

- Culture Loss: The use of new building materials and techniques leads to the loss of traditional Palestinian architecture and building practices (Senan, 1993).

- Loss of Cultural Identity: The proliferation of modernist buildings that do not reflect the values of Palestinian society creates a gap in cultural identity (Bshara, 2022).

4. Globalization and Green Imperialism

Globalization has greatly influenced architectural trends around the world. In Palestine, these effects are particularly evident through the concepts of sustainability and green building. This process, called green imperialism, means that the concept of sustainability is exploited by global capitalism and local values are ignored in this process (Hamoushan, 2023). In this context, many green building projects have been shaped to comply with global standards rather than local needs and cultural values (Ling et al., 2018), as seen in the case of Palestine. For example, some green building projects implemented in Palestine were built in accordance with Global sustainability standards. Although these projects were successful in terms of environmental sustainability, they did not adequately meet the social and cultural needs of local communities (Shaqir, 2023). This has left the concept of sustainability disconnected from local realities. Such projects are often financed by Global-based corporations, and the economic benefits of these projects often go to global capital, not local communities (Harvey, 2015).

Green imperialism manifests itself not only in the architectural field, but also in the economic and political spheres. In this process, global capital seeks to maximize its own interests by exploiting local resources and cultural values. In developing countries such as Palestine, this creates serious obstacles to the realization of sustainable development goals. Green imperialism, as an approach that ignores the needs and cultural values of local communities, weakens the concept of sustainability and causes the erosion of local architectural identity (Hamoushan, 2020).

5. Analysis

Evaluating the principles of sustainable architectural design concepts applied in Palestine is imperative, especially because contemporary trends have moved away from the traditional vernacular architecture. This deviation has led to the creation of architectural forms that are incompatible with the local environment and inadequate in meeting their users' functional needs. The study proposes two directions of analysis and synthesis for sustainable design in Palestine (Figure 5) needed for defining criteria.

1. First Analysis: A Comparison Between Traditional and Contemporary Palestinian Architecture

In this type of analysis, a comprehensive comparison is made between traditional architectural elements and contemporary architectural practices in Palestine. Traditional Palestinian architecture has many notable features in terms of sustainability, focusing on the use of local materials, energy efficiency, and climatic adaptation. In contrast, contemporary architecture is often based on design norms imported from globally and fails to adequately adapt to local environmental conditions and cultural values (Alragabi, 2024).

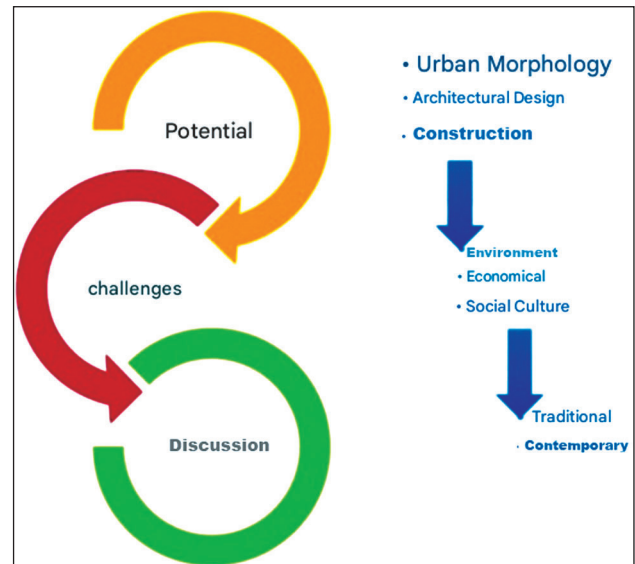


Figure 6. Analysis diagram framework, H. Alragabi, 2024.

This analysis examines how traditional architecture can be combined with contemporary sustainability practices and how both approaches can be optimized in terms of sustainability criteria. Traditional buildings utilize local resources to minimize environmental impacts, while contemporary buildings are often equipped with imported materials and energy-consuming systems. In this context, suggested criteria and strategies for sustainable design have been developed.

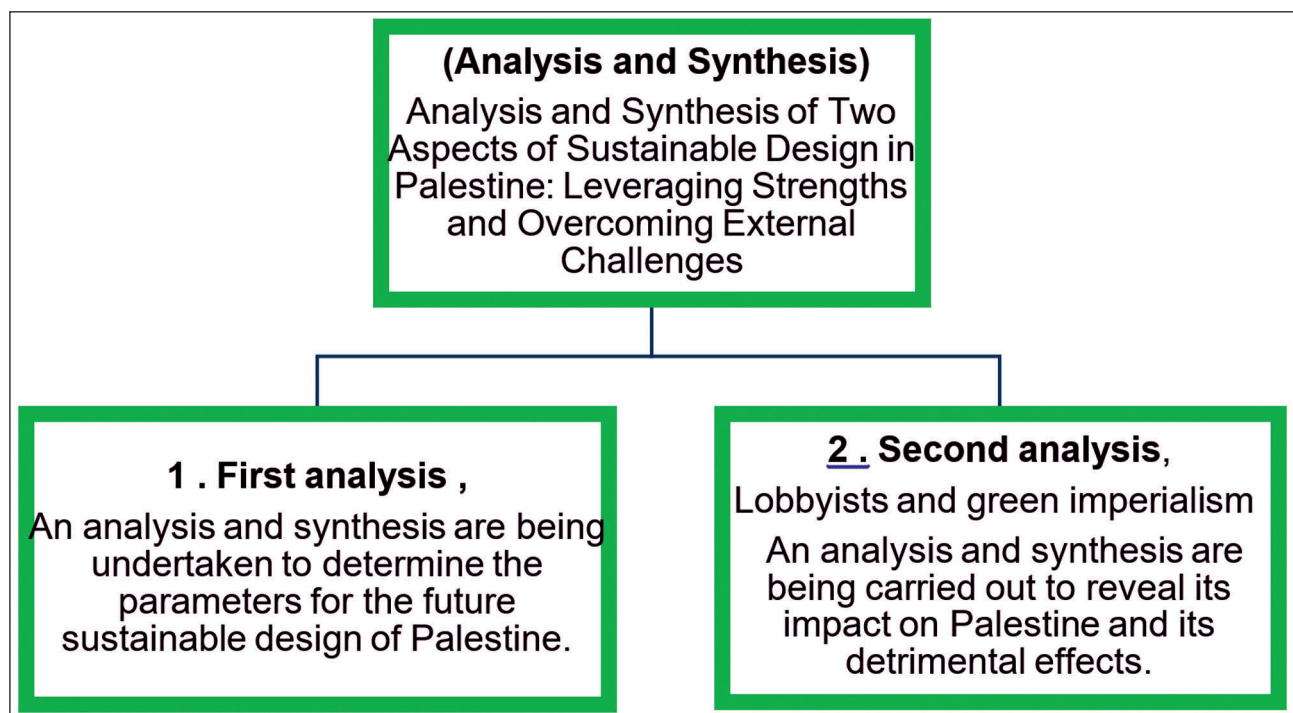


Figure 5. Analysis and Synthesis of Two Aspects of Sustainable Design in Palestine, H. Alragabi, 2024.

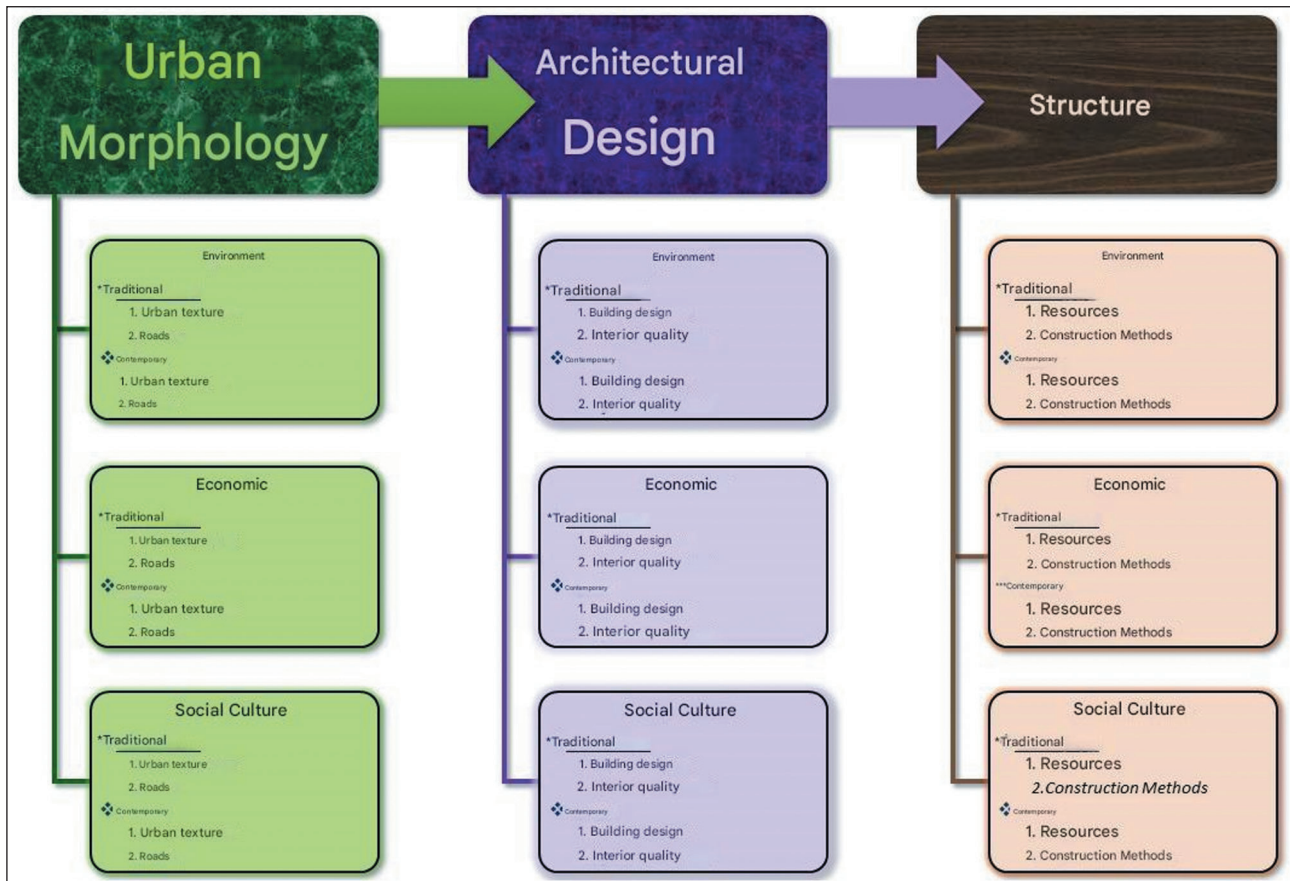


Figure 7. Analysis diagram framework, H. Alragabi, 2024.

For both contemporary and traditional different levels, such as urban level, architectural design, and structural level, analysis are needed while inspecting coordination with environment, economic, and sociocultural aspects as the pillars of sustainability.

2. Second Analysis: Evaluation of Green Building Projects

When it is about green building projects, the sustainability criteria encompass environmental, economic, and social sustainability dimensions. In particular, this analysis includes the evaluation of green building projects implemented in Palestine based on the proposed 25 sustainability criteria. The projects were evaluated according to environmental criteria, such as energy efficiency, water management, and material selection, as well as social criteria, such as community integration and cultural harmony (Alragabi, 2024). Evaluating sustainability initiatives requires a nuanced approach that considers not just environmental

impact but also economic, social cultural aspects. The elements we'll explore offer a comprehensive framework for analyzing sustainability initiatives, particularly in the context of avoiding pitfalls like green imperialism and ensuring genuine community development.

It must move beyond measuring environmental impact to evaluate sustainability initiatives effectively. It has developed a framework for a holistic analysis, selecting 25 elements that consider the social, economic, and cultural dimensions alongside environmental concerns. These elements were chosen based on their contribution to ensuring initiatives are truly sustainable, avoiding pitfalls like green imperialism and promoting genuine community development. By examining factors like local knowledge participation, social equity, cultural preservation, and economic integration, we can assess how well an initiative respects local context and fosters long-term positive change for the community.

Green imperialism refers to the imposition of Western environmental solutions onto developing

countries, often disregarding local knowledge and needs. Lobbying efforts by powerful actors can further distort sustainability initiatives to prioritize profit over genuine progress. To avoid these pitfalls, we need a framework that prioritizes local participation, cultural sensitivity, and long-term environmental health.

This research proposes a novel framework for analyzing the effectiveness of sustainability initiatives. Moving beyond a purely environmental focus, the framework identifies 25 key aspects informed by established principles and best practices. These elements encompass the social, economic, and cultural dimensions of sustainability, ensuring well-being and social justice and ensuring a more holistic evaluation. This approach is crucial for mitigating pitfalls like green imperialism and fostering genuine community development within sustainability efforts.

Each element serves a specific purpose in assessing an initiative's effectiveness. Here's a breakdown of the elements and the rationale behind their development:

1. **Incorporation of Local Knowledge and Expertise:** This criterion emphasizes the sensitivity of handling first: Local and Traditional Knowledge Participation: This element acknowledges the importance of respecting and integrating local knowledge systems into sustainability initiatives. By doing so, solutions are more likely to be culturally appropriate and effective in the long term. Assess how effectively the initiative incorporates traditional ecological knowledge, indigenous practices, and local resource management strategies. Secondly, dealing with the: Local Expertise Utilization: Assess the initiative's use of local experts' knowledge and skills, including scientists, engineers, farmers, community leaders, and traditional knowledge holders.
2. **Social Equity:** Analyze the initiative's efforts to improve well-being for all, not just a privileged few. Examine decision-making processes, access to resources, and distribution of benefits to ensure social equity.
3. **Meaningful Community Engagement:** Assess the initiative's level of community involvement throughout the process,

from planning and decision-making to implementation and evaluation. This fosters a sense of ownership, builds trust, and ensures culturally relevant solutions.

4. **Local Decision-Making Empowerment:** Assess whether the initiative empowers local communities to make decisions about their own sustainability efforts, fostering a sense of agency, building local capacity, and increasing the likelihood of long-term success.
5. **Cultural Heritage Preservation:** Identify how the initiative respects and integrates cultural traditions wherever possible. Look for incorporation of traditional building materials, respecting sacred sites, and supporting local artisans and craftspeople.
6. **Cultural Identity Respect:** Evaluate how the initiative respects and avoids disruptions to cultural practices, spiritual beliefs, and traditional aesthetics in design plans.
7. **Contextualized Local Models:** Evaluate how the initiative considers existing successful local models and adapts them to the unique circumstances of the community. This could involve studying traditional resource management practices, learning from existing community-based initiatives, and replicating successful models with appropriate adjustments.
8. **Supportive Legislation:** Analyze the initiative's efforts to advocate for policies that incentivize sustainable practices, regulate environmental impact, and protect the rights of local communities, creating a supportive legal framework.
9. **Preservation and Integration of Local Architecture in Green Design:** Sustainable design principles should complement and integrate with existing local architectural styles. This element encourages initiatives that respect and preserve cultural heritage while incorporating environmentally friendly design elements.
10. **Local Industry Support:** Evaluate how the initiative supports and revitalizes local industries by promoting local businesses that use sustainable practices, creating supply chains for locally sourced materials, and providing skills development for green jobs.

- 11. Equitable Financial Participation:** Evaluate whether the initiative ensures everyone in the community has access to and benefits from financial opportunities, considering microloans, grants, skills development programs, and fair pricing models.
- 12. Social and Economic Priorities:** Determine whether the initiative addresses the specific social and economic needs of the community. Analyze needs assessments and community consultations to ensure the initiative has a positive and lasting impact.
- 13. Economic Integration:** Sustainable development should promote inclusive economic growth that benefits the local community. This element encourages initiatives that create economic opportunities for all residents, not just a select few.
- 14. Sustainable Upliftment and Equitable Investment:** Evaluate whether the initiative strives for long-term positive change through investments in social, economic development, and environmental improvements, promoting social equity and environmental sustainability.
- 15. Empowering and Revitalizing local Agriculture:** This element acknowledges the specific challenges faced by Palestinian agriculture and emphasizes the importance of initiatives that support sustainable agricultural practices, promote food security, and revitalize this vital sector of the Palestinian economy.
- 16. Climate-Specific Solutions:** (Building climate resilience) Evaluate whether the initiative designs solutions tailored to the specific environmental conditions of the region. This could involve drought-resistant crops, flood mitigation strategies, or utilizing renewable energy sources based on local availability.
- 17. Prioritization of Local Solutions:** Assess the initiative's commitment to prioritizing locally sourced materials, technologies, and expertise, fostering self-reliance and reducing environmental impact. Consider life cycle assessments to compare the environmental footprints of local and imported options.
- 18. Compatibility with Local Climate and Resources:** Assess whether the initiative considers the specific environmental conditions of the region for long-term viability and environmental effectiveness. Analyze solutions for compatibility with local climate, resources, and ecosystems. This may involve using drought-resistant plants in arid regions, promoting water conservation techniques, and protecting sensitive ecosystems from development activities.
- 19. Dependency of Local Resources:** Assess the initiative's use of locally available resources to reduce reliance on external inputs and minimize environmental impact associated with transportation and production. This could involve using recycled materials in construction projects, sourcing timber from sustainably managed forests, and promoting local food production.
- 20. Community-Empowered Environmental Stewardship:** Assess the initiative's efforts to encourage community participation in environmental protection through citizen science initiatives, community gardens, educational programs, and volunteer opportunities, fostering a sense of responsibility and ownership for the local environment.
- 21. Sustainable Local Infrastructure:** Evaluate the initiative's investments in upgrading infrastructure, including waste management and public facilities, to improve living standards and environmental health. Analyze investments in renewable energy powered waste treatment facilities, promoting composting programs, and developing sustainable transportation systems (e.g., bike lanes, public transportation).
- 22. Promoting Sustainable Development with Local Integration:** Sustainability efforts should consider the interconnectedness of environmental, social, and economic aspects. This element highlights the importance of integrating sustainability principles across all facets of the initiative to ensure long-term success.
- 23. Adaptive Sustainability Solutions:** Analyze whether the initiative designs solutions that can adapt to changing circumstances like climate variations or economic fluctuations. This includes incorporating modular designs, flexibility for future upgrades, and regular monitoring and evaluation.

24. Culturally Appropriate Adaptation of International Standards: Analyze how the initiative considers and adapts existing international best practices to ensure they are culturally sensitive and ecologically sound in the local context.

25. Empowering Local Communities for Sustainable Energy Independence: Analyze how the initiative supports local communities in developing renewable energy sources and improving energy efficiency, reducing reliance on external energy sources for long-term environmental benefits.

By analyzing these 25 elements, you can gain a comprehensive understanding of a sustainability initiative's strengths and weaknesses in addressing the specific needs and challenges of the community it serves. This framework can be used to evaluate existing initiatives, design new ones, and ensure that sustainability efforts contribute to a more just and sustainable future for all.

The categorization of 25 standards across social-cultural, economic, and environmental dimensions, coupled with the identification of potential overlaps, highlights the interconnected nature of sustainability. It emphasizes that analyzing these standards through a filter of well-being and social justice provides a more holistic approach. Examining overlaps imposed to achieve the agendas of green imperialism and the interests of the lobbies, such as how economic practices might impact cultural preservation or how environmental solutions might influence social equity, allows for a more comprehensive analysis. This approach prevents isolated interventions that might unintentionally or intentionally create negative consequences for other dimensions.

6. Findings and Discussion

This research examines several green buildings selected in Palestine as examples of integrating traditional and contemporary architecture and sustainable design criteria (Table 1). Through the proposed strategy for analyzing the problem of thought in sustainable design in Palestinian architecture, the most prominent factors that influenced architectural thought on environmentally friendly architecture through pressure lobbies and green imperialism

were identified. Accordingly, the criteria, which reached 25 elements, were analyzed, and all elements were evaluated for each project influenced by environmentally friendly architecture ideas.

This comprehensive assessment revealed that the projects were generally successful in terms of environmental sustainability, but lacked social and economic sustainability. In particular, these projects, designed according to globally sourced standards, failed to adequately address the social and cultural needs of local communities.






These two analysis types can be used to emphasize the importance of integrating both traditional and contemporary architectural elements for the development of sustainable architecture in Palestine. The successful implementation of this integration can contribute to the creation of sustainable architectural structures not only for Palestine but also for other regions with similar climatic and cultural conditions.

The recommendations presented in this study stem from a comprehensive evaluation system that aims to improve sustainable architectural practices in Palestine and enhance the effectiveness of existing projects in terms of sustainability. This evaluation system assesses project performance based on environmental, social, and economic criteria, offering specific guidance for improvement. It emphasizes the importance of projects meeting higher standards in areas like energy efficiency, water management, and material selection. In particular, integrating the strengths of traditional Palestinian architecture, such as the use of local materials and climate adaptability, into contemporary designs is strongly recommended, to reduce the environmental footprint and harmonize with the local ecosystem.

The integration of traditional and contemporary architecture in terms of sustainability plays a critical role in the success of sustainable architectural practices in Palestine. The traditional architectural elements revealed in the first analysis offer significant sustainability advantages, especially in terms of the use of local materials, energy efficiency, and climatic adaptation. In contrast, the green building projects evaluated in the second analysis of the second analysis have achieved some successes in terms of environmental sustainability but have shown shortcomings in terms of social and economic sustainability.

Table 1. Green buildings in Palestine, H. Alragabi, 2024

Project Name	Supervising institution	Photos
1. Palestine Museum - Ramallah	Heneghan Peng - based in Dublin	
2. Shtayya Green Building - Nablus	Shtayya - Architecture Firm	
3. Mohsen Qattan Foundation New Building - Ramallah	Mohsen Qattan Foundation	
4. Aqaba Green School - Tubas	Palestinian Ministry of Education	<div> <p>مدرسة عقابا الخضراء حصلت على المستوى الذهبي و 146 / 200 نقطة</p>  </div>

5. AL Kamar - House of the Moon – Ramallah	ShamsArd	
6. Earth House in Gaza	ShamsArd	
7. Kaykab Ecological Museum – Ramallah	ShamsArd	
8. Wadi Almogir School - Hebron	Belgium Architecture Office	
9. BMIP Bethlehem	French investor A.F.G Architecture and Engineering Group	

10. Mashrabiya House Senan Abdelqader- Al- Quds/Jerusalem	Senan Abdelqader – Architect	
11. Desert House, Eco- friendly House in Jericho – Jericho	Hani Al Hassan - Architect	
12. Ramallah Beit Ikse Historical Center	Beit Ikse local community, RIWAQ	

The integration of traditional vernacular and modern architecture is critical to the success of sustainable architectural practices in Palestine. Integration of traditional architectural elements into green building projects can more effectively meet environmental, social, and economic sustainability criteria. Figure 7: Proposed Strategies for the Integration of Traditional and contemporary Architecture diagram illustrates how this integration process can be realized and provides strategic recommendations on how to combine the advantages of both architectural approaches.

This research highlights that while green building projects in Palestine often excel in environmental sustainability, they may fall short in addressing

the social and cultural needs of local communities. These projects tend to be designed according to global standards and can reflect a form of green imperialism, where local architectural identity is weakened and the interests of global capital are prioritized (Shaqir, 2023). Therefore, the preservation of traditional architectural heritage and its harmonious combination with modern technologies are crucial for achieving sustainable architecture in Palestine (Alragabi, 2024). Traditional vernacular Palestinian buildings offer an excellent example of local materials and climatic adaptation (Ragette, 2003; Thwainy, 2008), providing a strong basis for modern design in terms of environmental adaptability, affordability, and socio-cultural relevance.

7. Conclusion

This paper shows that sustainable architecture in Palestine can be made more effective through the preservation of traditional architectural heritage and the harmonious integration of modern technologies. The analysis (first analysis and second analysis) shows that the integration of traditional architecture with modern technology offers a great potential for sustainable architecture and that green building projects are successful in terms of environmental sustainability but insufficient in terms of social sustainability.

These analyses emphasize that sustainable architecture should not only be considered as an environmental concept but should also include social and economic dimensions. These findings, supported by the graphs, charts, and figures detailed in the Alragabi thesis (2024), provide important clues for the future of sustainable architectural design in Palestine. These findings serve as a roadmap for enhancing existing projects and guiding the design of future, more sustainable structures, and may also be applicable to other regions sharing similar climatic and cultural contexts.

References

1. Alragabi, H. (2024), "The issue of sustainable design thought between traditional and contemporary Palestinian architecture", Unpublished PhD dissertation, Mimar Sinan Fine Arts University Institute of Science and Technology, Istanbul.
2. Al-Sayed, W. (2003), "Concepts and ideas related to contemporary architectural design process followed by most of the architects of contemporary Arab", Unpublished PhD dissertation, University of London, London.
3. Amiry, S. and Tamari, V. (1989), *The Palestinian village home*, The Trustees of the British Museum, London.
4. Asquith, L. and Vellinga, M. (2006), *Vernacular architecture in the 21st century: Theory, education, and practice*, Taylor & Francis, London.
5. Baker, S. (2006), *Sustainable development*, Routledge, London.
6. Bshara, K. (2022), "Heritage in Palestine: Colonial legacy in postcolonial discourse", *Journal of the World Archaeological Congress*, Vol. 9 No. 2, pp. 925-319.
7. Edwards, B. and Turrent, D. (2000), *Sustainable housing: Principles and practice*, Taylor & Francis, London.
8. Fathi, H. (1986), *Natural energy and vernacular architecture: Principles and examples with reference to hot arid climates*, United Nations University Press, Chicago, IL, and London.
9. Hadid, M. (2002), *Architectural styles survey in Palestinian Territories*, Palestinian National Authority Ministry of Local Government, Ramallah.
10. Haddad, H. (2010), "A framework of sustainable design for the region of Palestine", Unpublished MSc dissertation, The Pennsylvania State University, University Park, PA.
11. Hamouchene, H. and Sandwell, K. (Eds.) (2023), *Dismantling Green Colonialism: Energy and Climate Justice in the Arab Region*, Pluto Press, London: Pluto Press.
12. Hamoushan, M. (2020), *Old Wells and New Colonization: A Critical Analysis of Climate Negotiations and Environmental Justice in the Middle East*, Pluto Press, London.
13. Harvey, D. (2015), *The Impact of Global Capitalism on Urban Spaces and Environmental Values*, Oxford University Press, Oxford, UK.
14. Hebron Rehabilitation Committee (HRC) (2008), *The Old Book of Hebron*, Hebron Rehabilitation Committee, Hebron, Palestine.
15. Isaac, J. (2010), *Environmental protection & sustainable development in Palestine*, Applied Research Institute - Jerusalem (ARIJ), Jerusalem.
16. Kudumovic, L. (2023), "Sustainability of the Palestinian historic village of Battir", *Journal of Cultural Heritage Management and Sustainable Development*, Vol. 13 No. 1, pp. 28-42. Available at: <https://doi.org/10.1108/JCHMSD-08-2020-0124>
17. Ling, C., et al. (2018), "Green Building Certification Systems and Their Impact on Local Cultures", *Journal of Sustainable Architecture*, Vol. 7 No. 2, pp. 123-137.
18. McKenzie, S. (2004), *Social sustainability: Towards some definitions*, Hawke Research Institute, Magill, South Australia.
19. McLennan, F. J. (2004), *The philosophy of sustainable design*, Ecotone Publishing Company, Kansas City, MO.

20. *Palestinian National Authority Ministry of Public Works and Housing (2010), Strategic plan for developing the housing sector in Palestine, Palestinian National Authority Ministry of Public Works and Housing, Ramallah.*
21. *Palestinian Central Bureau of Statistics (PCBS) (2010), The Palestinian environment to where?, President of the Palestinian Central Bureau of Statistics, Ramallah.*
22. *Palestinian Green Building Council (PHGBC) (2013), Palestinian Green Building Council, Palestinian Green Building Council, Ramallah.*
23. *Ragette, F. (2003), Traditional domestic architecture of the Arab region, American University of Sharjah Press, Sharjah.*
24. *Salman, M. (2018), "Sustainability and Vernacular Architecture: Rethinking What Identity Is", in Hmood, K. (Ed.), Urban and Architectural Heritage Conservation within Sustainability, IntechOpen, London.*
25. *Senan, Z. (1993), "Colonization and development of the built environment, the case of West Bank, Palestine", Unpublished PhD dissertation, University of Newcastle upon Tyne, Newcastle upon Tyne.*
26. *Shaqir, M. (2023), "Green Capitalism and Palestine: Arab Israeli Eco-Normalization: Greenwashing Settler Colonialism in Palestine and the Jawlan", in Hamouchene, H. and Sandwell, K. (Eds.), Dismantling Green Colonialism: Energy and Climate Justice in the Arab Region, Pluto Press, London.*
27. *Thwainy, A. (2008). Environmental Aptitude in Islamic Architecture. Iraq. Available at: www.alnoor.se/article.asp?id=25829 (accessed January 2024).*
28. *Tuffaha, A. (2009), "The impact of laws and regulations on the urban environment in Palestine", MSc dissertation, An-Najah National University, Nablus.*
29. *United Nations Country Team in the Occupied Palestinian Territory (2012), Gaza 2020: A livable place?, UNESCO, Paris.*
30. *World Commission on Environment and Development (1987), Our Common Future, Oxford University Press, Oxford.*

Corresponding Author
Hussein Alragabi,
Palestine Polytechnic University,
Hebron,
Palestine,
E-mail: halragabi@ppu.edu

Spatializing Prestige: Architectural Reflections of Brand Identity in Luxury Yacht Interiors

Inanc Isil Yildirim

Istanbul Galata University, Department of Interior Architecture and Environmental Design, Beyoglu, Istanbul, Türkiye.

Abstract

In the luxury market, brand identity is no longer confined to logos, slogans, or corporate color palettes—it is spatially experienced. This study examines how luxury yacht interiors serve as immersive expressions of brand identity through spatial design strategies and architectural articulation. Unlike static environments such as retail stores or hospitality venues, yacht interiors present a dynamic spatial condition where intimacy, motion, and personalization intersect. Drawing on branding theory, spatial semiotics, and interior architecture, the research investigates how materials, spatial hierarchy, lighting, and multisensory elements construct a narrative of prestige within maritime interiors. Case studies of yachts affiliated with fashion houses and bespoke shipyards reveal how abstract brand values such as exclusivity, heritage, and innovation are materialized at sea. The study conceptualizes these interiors as curated environments where the owner's personal narrative and brand persona converge—resulting in prestige being spatialized rather than merely signified. Ultimately, the paper advocates for identity-driven design approaches in yacht interiors, where architecture functions as a communicative medium for experiential branding in the age of hyper-personalized luxury.

Keywords: *Luxury yacht interiors; brand identity; spatial branding; interior architecture; brandscaping; experiential design; prestige; maritime design.*

1. Introduction

In the early decades of the 21st century, advancements in technology and global communication have redefined how consumers interact with brands. No longer passive receivers, today's luxury consumers seek meaningful, immersive experiences—spaces where personal identity aligns

with brand expression. Following the Industrial Revolution, consumer culture evolved to center the individual as both subject and symbol of consumption. This transformation intensified with the rise of digital media, expanding the scope of consumer environments to encompass both physical and virtual realms (Bauman, 2007).

Within this shifting landscape, the role of brand identity has gained unprecedented significance, particularly in the luxury sector. Luxury brands increasingly adopt the term “brand personality” over “identity” to evoke attributes such as elegance, sophistication, exclusivity, and intimacy. Consumers now perceive brands as personalities—recognizable, desirable entities with human-like traits they can identify with, aspire to, or integrate into their self-concept (Aaker, 1997).

Architecture, and particularly interior architecture, has become a vital conduit for articulating these abstract brand values. Physical space serves as a canvas where brand ethos is spatially performed and emotionally reinforced. The term “brandscaping,” initially associated with marketing and visual merchandising (Klingmann, 2007), has evolved in the context of interior design to denote the deliberate shaping of environments that embody brand narratives through material choices, spatial layouts, and sensory engagement.

Luxury yacht interiors, as the focal point of this study, represent a compelling case for exploring brandscaping in a mobile and exclusive design context. Yachts are not merely vessels but curated environments that blend movement with prestige, privacy with performance. Unlike flagship retail spaces or high-end hospitality venues, yachts are simultaneously private sanctuaries and symbolic statements. They serve both as intimate retreats and as projections of personal and brand identity—making them an ideal domain for examining how architectural space can embody brand values.

This paper investigates how interior architecture in luxury yachts functions as a medium for spatializing prestige, constructing environments that reflect, reinforce, and even amplify the brand identities they are commissioned to represent. Drawing on theoretical frameworks from branding (Keller, 1993), semiotics (Eco, 1976), and architectural psychology (Pallasmaa, 2005) - and supported by selected case studies and student design analyses - his research contributes to the discourse on branded environments within a global, mobile, and experience-driven design culture.

2. Theoretical Framework

Contemporary luxury yacht design is no longer solely governed by engineering or nautical function. With growing vessel sizes-many exceeding 80 meters and reaching up to 162 meters in length-interior design has evolved into a highly specialized discipline concerned with psychological comfort, spatial perception, and the expression of identity (Yildirim, 2023). As advancements in technology, materials, and spatial organization enable new typologies of floating environments, yacht interiors have transformed into alternative living spaces, not only for travel but for extended periods of habitation.

Historically, the emphasis in yacht construction prioritized structural safety and mechanical performance. However, as vessels increased in size and sophistication, attention has shifted toward user-centered design considerations such as privacy, spatial legibility, and emotional resonance. Poorly designed interiors that neglect behavioral patterns and psychological needs can diminish the experiential quality of even the most technically advanced yachts. This perspective aligns with architectural psychology, which posits that space is not passive but interacts with human emotion, cognition, and behavior (Pallasmaa, 2005). Interior design decisions in yachts are therefore increasingly informed by theories of spatial perception and environmental psychology. Kevin Lynch's (1960) concept of legibility-originally used to analyze urban environments-can be applied to yacht interiors to enhance navigability, comfort, and emotional clarity. In this regard, perceptual techniques such as spatial illusions, depth manipulation, and zoning strategies become tools for shaping user experience.

Moreover, the application of brand identity in yacht interiors extends beyond aesthetics to encompass the full sensory and spatial narrative of the experience. As Yildirim (2023) notes, spatial design becomes a communicative act-one that shapes how users perceive not only their environment but also their own social and emotional positioning within it. In high-end vessels, brand expression is deeply embedded in the design language, influencing choices of material, lighting, circulation, and the choreography of private versus social zones.

Ultimately, this framework situates the luxury yacht interior at the intersection of brand theory, spatial semiotics, and psychological design-arguing that architectural prestige is not only signified but spatially enacted.

3. Methodology

This study employs a qualitative multiple case study methodology, supplemented by design-based thematic analysis, to examine how luxury yacht interiors manifest brand identity through architectural and experiential elements. This approach allows for a comprehensive exploration of both tangible and symbolic dimensions of spatial design within bespoke maritime environments.

The selection of this methodology is grounded in the need to address the intersection of psychological, spatial, and branding constructs, which require interpretive depth and contextual sensitivity. Given the highly individualized nature of yacht interiors-each a unique reflection of owner preferences and brand alignment-a case study method is particularly appropriate. It enables a rich, layered understanding of how interior elements articulate narratives of prestige, exclusivity, and personal identity. (Yildirim, 2023). To structure this investigation, the following three-tiered analytical framework was implemented:

Case Selection – A targeted sample of branded yachts were curated based on representational strength, spatial clarity, and experiential intent.

Design Component Analysis – Key elements such as spatial hierarchy, materiality, lighting, and circulation were examined for their alignment with brand attributes.

Thematic Synthesis – Identified patterns were synthesized into broader thematic strategies, in-

cluding hierarchical zoning, sensory branding, and prestige layering.

4. Analysis and Findings

This section presents a layered analysis of selected yacht interiors and academic design projects that exemplify the spatialization of brand identity in luxury marine contexts. Three - Layered Case Selection was applied. Accordingly, Brand-Based Yacht Examples selected.

a. Hermès Yacht Interior (Why):

Transferring the approach of fashion brands to yacht design and transferring the concept of “Luxury personality” to interior space provides a clear example.

b. Lürssen Yachts (Why):

As a brand with maritime roots, one of the leaders in the Mega yacht sector and Material, privacy, zoning and spatial equivalent of brand status are analyzed.

c. Sunreef Yachts (Why):

Combines catamaran luxury with sustainability and “green branding”. In this case, concepts such as nature, silence, interior-exterior transitions are examined.

The findings are organized around representative case studies that embody distinct approaches to branding through architectural and interior strategies. The analysis is supported by thematic observations and, where available, conceptual plans and annotated diagrams to illustrate spatial decisions.

This framework supports an interpretive reading of space that bridges brand theory with architectural psychology and design methodology, offering insights into how spatial strategies reinforce luxury brand values.

4.1 Hermès Yacht Interior: Brand Personality as Spatial Narrative

Hermès, as a maison synonymous with heritage craftsmanship and understated luxury, offers a unique case for examining how brand personality is spatially embodied. Its core values-artisanal excellence, timeless simplicity, and sensory refinement-are translated into interior architecture not merely through style, but through spatial storytelling

(Klingmann, 2007). Materiality is central to Hermès’ design language. Hand-stitched leather, natural linens, teak, and bronze are employed not just for their tactile and visual qualities but as signifiers of identity. These elements serve as a semiotic code, communicating tradition, precision, and elegance to the user (Eco, 1976). Spatial organization in Hermès-affiliated yachts avoids visual noise or over-articulation. Spaces are structured with intuitive clarity, allowing users to navigate without the need for explicit signage. This aligns with Kevin Lynch’s concept of spatial legibility, where orientation is achieved through environmental coherence (Lynch, 1960). Light is also a narrative medium: indirect lighting, natural apertures, and filtered reflections enhance the contemplative and quiet luxury that Hermès promotes (Pallasmaa, 2005). Movement within the space is seamless-hallways curve softly, transitions are unobtrusive-resembling the elegance and discipline of the Hermès brand. Thus, Hermès’ spatial branding becomes a choreographed interplay of material, movement, and mood, converting intangible values into physical presence (Yildirim, 2023).

Hermès, an icon of French luxury, extends its distinctive identity into the maritime world through the Wally-Hermès Yachts (WHY) project. The WHY 58x38 catamaran, co-designed with Wally Yachts, serves as an ideal case for examining how brand personality can be spatialized through architectural expression and interior design strategies. The interior of the WHY yacht reflects the core traits of the Hermès brand-craftsmanship, timelessness, discretion, and sensory elegance. Material choices such as untreated teak, saddle-stitched leather, linen textiles, and matte bronze finishes not only evoke the artisanal heritage of the brand but also create a tactile narrative of understated luxury. These materials are not merely decorative; they are semantic components, reinforcing Hermès’ commitment to authenticity and permanence.

Spatial organization within the vessel is characterized by generous volumes, smooth transitions between interior and exterior, and the minimization of visual clutter. Unlike the verticality and compartmentalization often found in traditional yachts, Hermès promotes horizontality and openness-concepts aligned with serenity, horizon, and continuity. This design ethos supports the notion of luxury as calmness rather than extravagance.

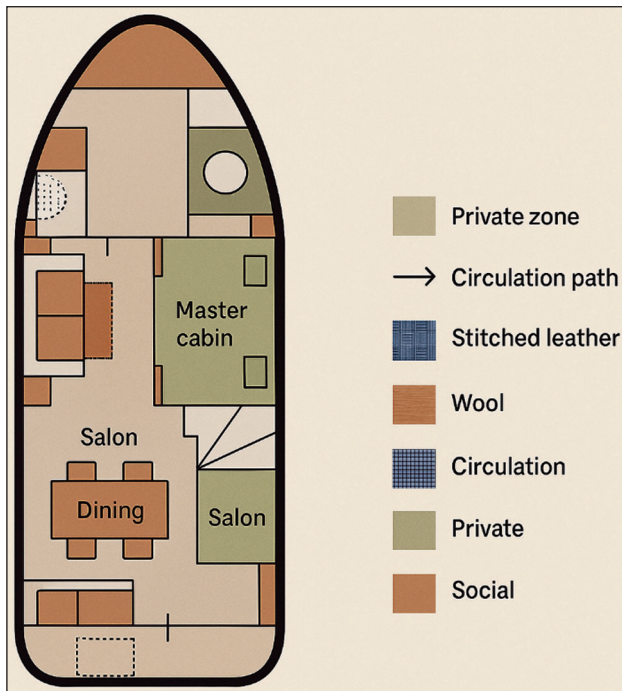


Figure 1. Conceptual diagram of spatial openness and material layering in Hermès Yacht Interior

The circulation is designed to be intuitive, fluid, and stress-reducing. Public zones such as lounges and dining areas benefit from panoramic glazing, while private quarters are recessed and acoustically isolated. Lighting is modulated through a combination of indirect sources and natural daylight, reinforcing diurnal rhythms and psychological comfort.

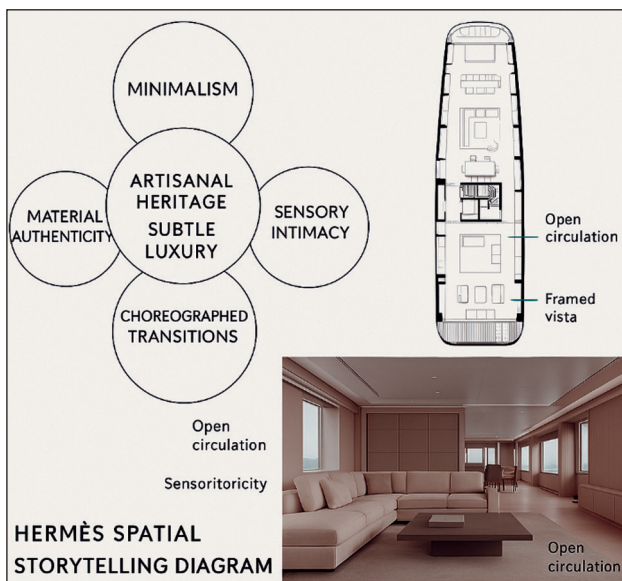


Figure 2. Spatial storytelling in a Hermès-branded yacht interior

In effect, the Hermès yacht operates as a floating manifesto of brand values: it translates abstract notions of elegance and restraint into spatial experiences. This transformation is not rhetorical, but architectural—the brand’s identity becomes embedded in the user’s sensory, emotional, and spatial interaction with the yacht.

4.2 Lürssen Superyachts: Spatial Hierarchies and the Architecture of Status

Lürssen, a German shipyard synonymous with ultra-luxury, scale, and technical prowess, provides a compelling case study of how spatial hierarchy can be leveraged to manifest brand prestige. The interior environments of Lürssen yachts—such as Dilbar and Azzam—are not only grand in volume but structured to communicate power, privacy, and exclusivity through architectural form.

The brand’s spatial identity is driven by vertical and horizontal stratification. Private quarters are typically located on upper decks with panoramic views, while guest and formal social spaces span central zones, and staff/service areas remain fully concealed on lower levels. This hierarchy of space is not incidental but reflects a precise choreography of visibility, access, and control—critical components of prestige-based experience design. In yachts such as Dilbar and Azzam, the use of double-height salons, grand staircases, and axial symmetry reinforces notions of dominance and hierarchy (Yildirim, 2023). These formal qualities are further enhanced by rare materials—onyx, gold-leaf finishes, rare woods—and bespoke artwork, which collectively signal exclusivity and wealth.

Materiality further reinforces this structure. The use of onyx, gold-leaf inlays, silk paneling, and hand-carved rare woods establishes a visual language of excess and personalization. Unlike Hermès, which uses materials to convey tactile intimacy, Lürssen uses them to symbolize opulence and mastery.

Circulation paths are often deliberately designed to separate guest and staff zones, emphasizing privacy, control, and social order. The spatial organization reflects a philosophy of prestige that is less about emotional intimacy (as in the Hermès case) and more about territorial control and symbolic hierarchy. The circulation systems are deliberately partitioned to isolate crew movement from guest

paths, allowing uninterrupted luxury immersion. Grand staircases and elevators placed on axial lines guide the guest through a sequence of dramatic spatial reveals, akin to a cinematic journey—each space more impressive than the last.



Figure 3. Zoning and circulation model in a Lürssen mega yacht – Dilbar (156m)

These strategies collectively create what may be described as a “territorial luxury,” where status is not only seen but spatially enforced (Keller, 1993). The Lürssen approach to branding through architecture is thus not about harmony or restraint, but about controlled magnificence and experiential hierarchy. This case illustrates how luxury branding in yacht interiors transcends visual iconography and is instead enacted through spatial storytelling, atmospheric design, and multisensory coherence.

4.3 Sunreef Yachts: Sustainability and Experiential Luxury

Sunreef Yachts, a Polish shipyard at the forefront of sustainable catamaran innovation, presents a distinctive approach to branding that emphasizes environmental consciousness, hybrid mobility, and immersive comfort. The brand’s identity is closely tied to its pioneering integration of green technologies—solar panels, battery banks, and hydro-generators—which have redefined expectations in luxury marine design. However, it is through the interior architecture that this eco-conscious identity is fully embodied and communicated (Yildirim, 2023). The spatial language of Sunreef interiors focuses on fluid transitions between inside and outside, often featuring retractable walls, panoramic sliding doors, and integrated terraces. This permeability not only enhances the user’s connection to the natural envi-

ronment but aligns with the brand’s ethos of harmony and openness (Pallasmaa, 2005). The zoning avoids rigid separations; instead, the layout encourages flexible use and adaptive spatial narratives.

Materiality in Sunreef vessels further reinforces the sustainability narrative. Interiors often incorporate bamboo finishes, natural fiber textiles, recycled composites, and low-VOC surface treatments. These selections are not only ecological but also multisensory—offering textures and scents that distinguish Sunreef from the artificiality often associated with high-luxury contexts (Pallasmaa, 2005). Lighting strategies utilize daylight capture and circadian-responsive systems, allowing the spatial atmosphere to shift in tune with environmental rhythms. Moreover, the user experience is guided through subtle spatial cues, such as floor texture changes, sightline framing, and the use of natural cross-ventilation to suggest direction and function (Bauman, 2007).

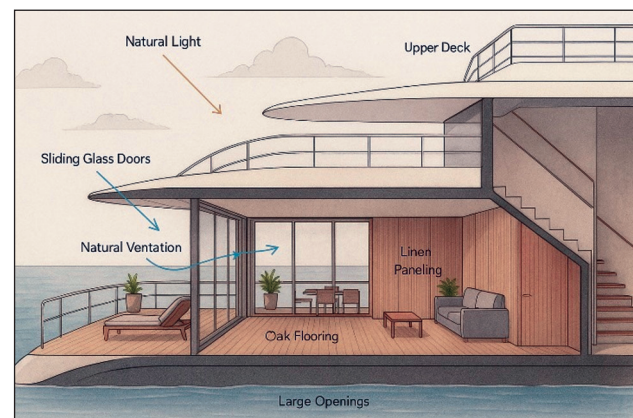


Figure 4. Interior-outdoor integration and material sustainability in Sunreef catamaran layout

The diagram illustrates retractable glazing systems between lounge and deck, bamboo-finished interior wall zones, solar-integrated rooftop surfaces, and naturally ventilated spatial corridors. Spatial continuity and environmental responsiveness are highlighted as part of the brand’s identity-driven spatial strategy.

Sunreef exemplifies a new paradigm in luxury yacht design, where branding is no longer merely a statement of power or prestige, but of ecological alignment and sensory engagement. The interior thus becomes a stage for experiential sustainability—an architectural response to values that transcend material luxury.

5. Results and Conclusions

This study has revealed that luxury yacht interiors function as powerful spatial instruments through which brand identity is not only reflected but fully embodied. The in-depth analysis of three distinct cases-Hermès, Lürssen, and Sunreef-demonstrated that interior architecture in high-end yachts is no longer a purely functional or aesthetic domain; rather, it acts as a performative and narrative medium that translates abstract brand values into spatial experience. Each case exemplifies a unique spatial branding strategy. Hermès translates its artisanal heritage, subtle luxury, and sensory intimacy into spatial narratives through minimalism, material authenticity, and choreographed transitions. It positions the yacht not merely as a vehicle, but as a sensorially rich, culturally coded habitat. Lürssen, on the other hand, communicates prestige and exclusivity through strict spatial hierarchies, rare materials, and monumental volumetrics. Its interiors reinforce social order and brand power through vertical and horizontal separation, symbolizing status in built form. Sunreef represents an emerging paradigm, wherein brand identity is no longer defined solely by aesthetic or legacy, but by ecological alignment, experiential comfort, and permeability between human and environment. It positions the yacht interior as a living, adaptive ecosystem.

The findings clearly demonstrate that brand identity is not a graphic or verbal construct alone-it is spatially manifested and experientially perceived. Interior architecture becomes an active agent in shaping how luxury is understood, consumed, and emotionally processed. The use of form, material, light, and circulation to evoke brand values-what may be called spatial storytelling-is a critical strategy in translating abstract attributes into tangible environments. Without spatial coherence and emotional legibility, even the most recognized brand may fail to resonate on the level of lived experience.

Materiality, in this context, functions not only as a sensory asset but also as a symbolic language. Materials are carefully selected to communicate ideas-whether they suggest sustainability (as with bamboo or recycled composites), heritage (stitched leather or bronze), or exclusivity (onyx or rare hardwoods). Likewise, zonality and circulation patterns transcend mere functionality; they serve as ideo-

logical frameworks that reflect hierarchy, intimacy, openness, and the sociocultural values embedded within each brand. As luxury continues to evolve toward hyper-personalization, ethical consciousness, and emotional depth, it is increasingly through interior architecture-not logos or slogans-that these shifts are spatially realized. The yacht interior, then, becomes a stage for immersive branding: a narrative environment in which identity, perception, and human experience converge. As luxury consumers shift toward more purpose-driven, experience-based expectations, interior designers of yachts are called upon not just to create elegant spaces, but to embody stories, values, and philosophies. The yacht interior is no longer just a technical feat-it is a narrative architecture. In this narrative, brand identity, user psychology, and spatial intelligence must harmonize to create environments that are not only exclusive, but deeply meaningful.

References

1. Aaker, J. L. (1997), "Dimensions of brand personality", *Journal of Marketing Research*, Vol. 34 No. 3, pp. 347-356. <https://doi.org/10.2307/3151897>
2. Bauman, Z. (2007), *Consuming Life*, Polity Press, Cambridge.
3. Eco, U. (1976), *A Theory of Semiotics*, Indiana University Press, Bloomington, IN.
4. Keller, K. L. (1993), "Conceptualizing, measuring, and managing customer-based brand equity", *Journal of Marketing*, Vol. 57 No. 1, pp. 1-22. <https://doi.org/10.1177/002224299305700101>
5. Klingmann, A. (2007), *Brandscapes: Architecture in the Experience Economy*, MIT Press, Cambridge, MA.
6. Lynch, K. (1960), *The Image of the City*, MIT Press, Cambridge, MA.
7. Pallasmaa, J. (2005), *The Eyes of the Skin: Architecture and the Senses*, 2nd ed., Wiley, Chichester.
8. Yildirim, İ. I. (2023), *Yatlarda İç Mekân Tasarımı ve Algisi*, YEM Yayın, İstanbul.

Corresponding Author

Inanc Isil Yildirim,
İstanbul Galata University,
İstanbul,
Türkiye,
E-mail: inancisilyildirim@gmail.com

Preparing the Camera Ready Paper for TTEM Journal

First Author¹, Second Author², Third Author³

¹ First affiliation, City, Country,

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Abstract

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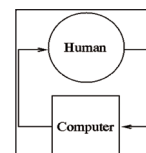


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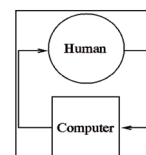


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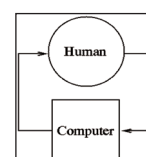


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Zhu, G. and Xiao, Z. (2017), "Creation and imitation of a milk flavour", Food & Function, Vol. 8, pp. 1080-1084. DOI: 10.1039/c7fo00034k

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e.g. Campbell, A. and Kahn, R.L. (2015), American National Election Study, 1948, ICPSR07218- v4, Interuniversity Consortium for Political and Social Research (distributor), Ann Arbor, MI. Available at: <https://doi.org/10.3886/ICPSR07218.v4> (accessed 20 June 2018)

Gorenc Novak, M. and Velušček, D. (2016). Prediction of stock price movement based on daily high prices. Quantitative Finance, Vol. 16 No.5, pp. 793- 826. DOI: 10.1080/14697688.2015.1070960

Corresponding Author

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