ECONOMIC-FINANCIAL FEASIBILITY ANALYSIS OF PROJECTS IN HISTORIC SITES: CASE OF ENGENHO MONJOPE

ANÁLISE DE VIABILIDADE ECONÔMICO-FINANCEIRA DE EMPREENDIMENTOS EM SÍTIOS HISTÓRICOS: CASO DO ENGENHO MONJOPE

ANÁLISIS DE VIABILIDAD ECONÓMICO-FINANCIERA DE PROYECTOS EN SITIOS HISTÓRICOS: CASO DE ENGENHO MONJOPE

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ABSTRACT
Restoring historical heritage is more than keeping the memory alive, it also consists of applying science to the evolution of public equipment to the modern needs of society. This objective article presents the economic-financial feasibility study of the historical and cultural heritage of Engenho Monjope, which was built in the mid-1600s, being listed in 1986 by the Government of Pernambuco, as a State Historic Heritage, recognized by the community as an asset. heritage to be preserved. The methodological processes were separated into two stages, the surveys being: costs (investment, operation and maintenance), revenues and result of the 1st year and the critical evaluation (Cost-benefit and Distributive Impact). The pathogenic results that the project is viable in the social, patrimonial and distributive impact (Cid) aspects, as well as in the economic and financial aspects. As a great contribution to success, the research shows that economic and financial feasibility studies are crucial to guarantee its undertakings, avoiding unforeseen events in the operation, preventing situations, suggesting postures and recommendations that foster success.

KEYWORDS
Historical Heritage; Sustainability; Economic-financial viability; Private Public Partnerships.

RESUMO
Restaurar um patrimônio histórico é mais do que manter a memória viva, consiste também na aplicação da ciência para a adequação do equipamento público às necessidades modernas da sociedade. O presente artigo objetiva apresentar o estudo de viabilidade econômico-financeira do patrimônio histórico-cultural do Engenho Monjope, o qual foi construído em meados de 1.600. sendo tombado em 1.986, pelo Governo do Pernambuco, como Patrimônio Histórico Estadual, reconhecido pela comunidade como bem patrimonial a ser preservado. Os processos metodológicos foram separados em duas etapas, sendo os levantamentos: dos custos (investimento, operação e manutenção), das receitas e resultado do 1º ano e a avaliação crítica (Custo-benefício e Impacto Distributivo). Os resultados obtidos demonstraram que o projeto é viável nos aspectos social, patrimoniais e coeficiente de impacto distributivo (Cid), assim como nos aspectos econômico e financeiro. Como grande contribuição a pesquisa apresenta que os estudos de

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viabilidade econômico-financeiro são cruciais para garantir o sucesso destes empreendimentos, evitando imprevistos na operação, prevendo situações, sugerindo posturas e recomendações que fomentem o êxito.

PALAVRAS-CHAVE
Patrimônio Histórico; Sustentabilidade; Viabilidade econômico-financeiro; Parcerias Públicos Privadas.

RESUMEN
Restaurar un patrimonio histórico es más que mantener viva la memoria, también consiste en aplicar la ciencia para adaptar los equipamientos públicos a las necesidades modernas de la sociedad. Este artículo tiene como objetivo presentar el estudio de viabilidad económico-financiera del patrimonio histórico-cultural de Engenho Monjope, construido a mediados del siglo XVII. siendo catalogado en 1986, por el Gobierno de Pernambuco, como Patrimonio Histórico del Estado, reconocido por la comunidad como bien patrimonial a preservar. Los procesos metodológicos se separaron en dos etapas, siendo las encuestas: costos (inversión, operación y mantenimiento), ingresos y resultados del 1er año y evaluación crítica (Costo-Beneficio e Impacto Distributivo). Los resultados obtenidos demostraron que el proyecto es viable en los aspectos sociales, patrimoniales y del coeficiente de impacto distributivo (Cid), así como en los aspectos económicos y financieros. Como aporte importante, la investigación presenta que los estudios de factibilidad económico-financiera son cruciales para garantizar el éxito de estos emprendimientos, evitando imprevistos en la operación, prediciendo situaciones, sugiriendo actitudes y recomendaciones que fomenten el éxito.

PALABRAS CLAVE
Patrimonio histórico; Sostenibilidad; Viabilidad económico-financiera; Asociaciones Público-Privadas.

1. INTRODUCTION

The preservation of historic sites is a widely discussed topic today; however, this process is extremely complex, as it requires financial and human resources that are not always available and sometimes conflicts with rapid urban growth. (RODRIGUES; AMORIM, 2018; AMORIM; SAMPAIO; SILVA, 2022; AMORIM; SAMPAIO; SILVA, 2023).

To preserve a historic asset, it is not enough to simply restore it; it must also be integrated into society, ensuring appropriate and synergistic use with the needs of the local population. In this way, social aspects should be integrated with economic aspects (OLIVEIRA, 2022), enabling sustainable regional development.

Therefore, to achieve sustainability of an enterprise located in historic sites, it is not enough to simply restore the built heritage (MOURA; LIRA; MELO, 2022); often it is necessary to requalify the asset, that is, to assign a new function to the asset together with actions to improve its aesthetic aspect (DEMARCHI; NITO, 2022), ensuring the sustainability of the enterprise. Therefore, requalification redefines the broader sense of conservation actions.

Therefore, "sustainability, based on its economic, environmental, and social spheres, has been increasingly discussed" (ÁVILA et al., 2016, p. 7), and it is an essential premise to evaluate the economic and financial feasibility of enterprises located in historic sites.

According to Ross et al. (2015), economic and financial feasibility study is characterized by the relationship between money, time, considerations regarding risk, and return. It involves data collection, estimation of net cash flow, determination, calculation, and analysis of economic viability indicators, issuing a conclusive opinion, and managerial decision-making (BORCA JR; BARBOSA-FILHO, 2023). For this, market uncertainties and variations regarding the potential profitability of the studied product are considered, thus evaluating whether the projections raised can be realized or not (OLIVEIRA, 2022).

The economic and financial feasibility study uses indicators in the investment analysis process, with the most common ones being: net present value (NPV), internal rate of return (IRR), minimum attractive rate (MAR), and payback period. After determining these indicators, they should be analyzed considering, among many variables, the objectives and structure of the organization intending to implement or produce this innovation. Feasibility must meet the organization's demands, which involves not only economic and financial values but also the willingness to take the risk of investing in the new product or project. (BIASI; ZILLI; CORREIA, 2022).

It is common for management and administration in projects located in historical sites to be a partnership between the government and the private sector (OLIVEIRA, 2022). This partnership is welcome as it increases the chances of ensuring financial sustainability for the maintenance of historical heritage, while reducing government costs and increasing social benefits.

With that said, the object of this research is the requalification project of the Monjope Sugar Mill, located in Igarassu, a municipality in the state of Pernambuco, Brazil. The mill was built in the mid-1600s and was designated as a State Historical Heritage Site by the Government of Pernambuco in 1986, recognized by the community as a heritage asset to be preserved. According to a historical survey conducted by the Foundation of Historical and Artistic Heritage of Pernambuco (FUNDARPE), in its document titled "Actions for the Safeguarding of the Monjope Sugar Mill," it is noted that the Monjope Sugar Mill is the only mill in the Metropolitan Region of Recife that contains the four characteristic buildings of a sugar mill: the main house, chapel, slave quarters, and sugarcane field, along with the overseer's house, enriching the composition of the historic site.

Given such historical significance, this research aims to present the economic and financial feasibility study conducted for the implementation of the Monjope Sugar Mill Cultural and Ecological Reserve project. This involves evaluating the economic impact and economic and financial feasibility of the investment, as well as the financial sustainability of preserving the historical heritage and the relationship between government costs and social benefits over a period of 20 years.

2. AREA CARACTERIZATION

The municipality of Igarassu is located between the North Metropolitan economic pole and Goiana, which consists of the municipalities of Paulista, Abreu e Lima, Araçoiaba, Igarassu, Itapissuma, Goiana, and Ilha de Itamaracá. Together, these seven municipalities occupy a continuous area of 1,262.285 km^2, where 650.820 inhabitants live, representing 1.28% of the state's area and 7.38% of the population of Pernambuco. Approximately 70% of the active population in this region is engaged in service sector activities. It is also worth noting that this region contributes 5.90% to the formation of the state's Gross Domestic Product (GDP). (CONDEPE/FIDEM, 2020).

The North Metropolitan and Goiana poles are known for being the cradle of settlement in Brazilian lands, possessing a rich natural and historical heritage, with numerous religious, civil, and military buildings representative of the colonial period, comprising a vast and valuable collection that reveals the splendor of its past (CONDEPE/FIDEM, 2020). The North Metropolitan and Goiana poles are rich in potentialities related to urban infrastructure (Figure 1), tourism and culture (Figure 2), and socioeconomic development (Figure 3).

Figure 1: Urban infrastructure in the North Metropolitan and Goiana Poles
Source: CONDEPE/FIDEM, 2020.

Figure 2: Tourism and culture in the North Metropolitan and Goiana Poles
Source: CONDEPE/FIDEM, 2020.

Figure 3: Socioeconomic development initiatives in the North Metropolitan and Goiana Poles
Source: CONDEPE/FIDEM, 2020.

2.1 Object of study

2.1.1 The Engenho Monjope

The Engenho Monjope is part of the 13 sugar mills classified in the Preservation Plan of the Historic Sites of the Metropolitan Region of Recife. It was listed as a state heritage site through process no. 0038/86 with an announcement dated 28/02/86, after which it was expropriated and compensated according to the relevant legal norms.

The Engenho is strategically located, situated one kilometer west of the BR-101 highway, 31 km from the capital Recife, between the Cruz de Rebouças district and the center of the municipality of Igarassu. It lies along a stretch that is part of the tourist circuit connecting the northern coast of the state of Pernambuco to João Pessoa/PB.

The Master (Figure 4) is a solid, two-story prismatic construction with a mansard roof, and a support structure located at a higher point of the terrain, from which a clear view of all the activities of the engenho is allowed. It is characterized by arcades on the facade of the main entrance, topped by doors with lowered arches on the upper floor, protected by balconies with cast iron railings.

Figure 4: Socioeconomic development initiatives in the North Metropolitan and Goiana Poles
Source: Authors, 2024

The chapel, located next to the Master, features a choir and pulpit, in addition to the bell tower, sacristy, and ossuary (Figure 5). The Moita, situated to the left of the Main House, showcases the entire structure of the

sugar cane mill mechanism, the water channels that made it turn for the production of cane syrup and brandy. Adjacent to the Moita in a strategic position (opposite side) is the Captain of the Woods' House.

Figure 5: The Chapel of Engenho Monjope
Source: Authors, 2024

In terms of production characteristics, the use of hydraulic power, through a vertical water wheel, to drive the mill represents a feature of the mill's production process. Contextually, sugar mills of that time used three types of motive power: hydraulic, human force, and animal traction. The choice of one or the other type of energy depended on economic and geographical factors. Additionally, the mill stands out for having a set of English metal mills. This fact highlights the Monjope process, as most sugar mills opted for wooden equipment to facilitate maintenance.

In this aspect, the Monjope ensemble is of significance because it still preserves, albeit with the main house in a compromised state, the entire set of buildings. This showcases the grandeur of the main house and the chapel, bearing witness to the economic cycle of sugarcane and the class relations of the time.

The architecture of the time sought to replicate European trends while reconciling contingent factors such as the site's geography, natural landscape, available materials, and the requirements resulting from the tropical climate of the Colony. Additionally, the architecture aimed to adapt to local ways of living, habits, and customs, such as Portuguese imperialism, social relationships, and the needs of rural patriarchal and slaveholding society. Despite the less defined internal spaces due to the state of preservation, it can be observed that the Monjope Master fulfilled the objectives of the time: providing space for an extended family while maintaining isolation and privacy.

2.1.2 The Cultural and Ecological Reserve of Engenho Monjope

The requalification project of Engenho Monjope was developed with the aim of structuring the foundations for the implementation of the Cultural and Ecological Reserve of Monjope Sugar Mill, which will host local knowledge developed by humans, agricultural, gastronomic, artisanal, semi-industrial practices, habits, and forms of human resistance, allied with the preservation of cultural and natural heritage. Participants in the project will include performers, artists, artisans, fishermen, farmers, breeders, cooks, administrators, among others, as well as guides and facilitators of social inclusion in the productive environment. (FUNDARPE, 2018).

For this purpose, the Reference Center will have a shared management, aiming at the protection and conservation of the property as cultural, historical, architectural, archaeological, environmental, and landscape heritage, recognized at the local, state, national, and international levels. Additionally, it will focus on reintegrating these aspects into the daily life of the population with the sugar mill, integrating them into tourist itineraries, and boosting the local economy.

Thus, the requalification guidelines for Engenho Monjope were based on local socio-cultural vocations and potentials. A demand analysis study was conducted, which diagnosed the best uses according to popular decision-making and potential investors. Therefore, the venture comprised service, cultural, and gastronomic sectors, with the listed facilities distributed as per Table 1.

Sectorization	Function	Equipment
Services	Events	Chapel: Spaces for ecumenical worship and buffet services.
		Soccer field
		Multicultural space
		Convention Center and Professional Training Center
	Hotelkeeping	Slaves, where the inn will be located.
Cultural	Craft Shop	Máster and Moita
	Museum	
	Exhibition/Visits	
Gastronomic	Cafeteria	Capitain of yhe Wood's House
	Regional Restaurant	

Table 1: Sectorization of the venture
Source: Authors, 2024

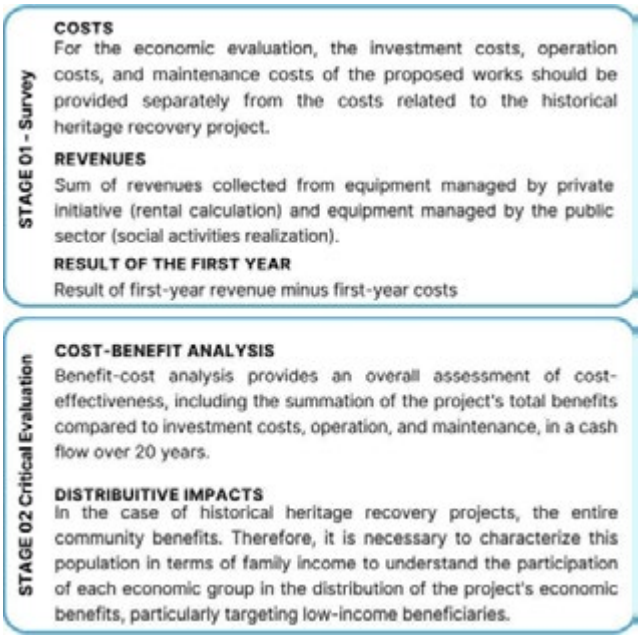

Figure 6: Research stage.
Source: Authors, 2024

3. METHODOLOGY

3.1 Research characterization

The research is of an applied nature aiming to generate knowledge for practical application, using the case study procedure with a quantitative approach, indicating that the relationships presented solely refer to the research object. The methodological processes were divided into two stages (as per the flowchart presented in Figure (6).

3.2 Survey

3.2.1 Costs

For the economic evaluation, the investment costs and operation and maintenance costs of the proposed equipment related to the historical heritage recovery project were presented.

The economic analysis works with prices referred to as efficiency prices, correcting prices based on market imperfections (taxes and subsidies) and reflecting the social cost of unskilled labor.

Thus, it was necessary to provide the investment costs and operation and maintenance costs, broken down into the following categories: skilled labor, unskilled labor, national materials, imported materials, national equipment, imported equipment.

For the transformation of financial prices into economic prices, the conversion factors defined in the Operational Regulation of the PRODETUR Nordeste II Program, Appendix M-2, were used. For economic benefits, the Standard Conversion Factor of 0.94 (zero point ninety-four) was applied. (PRODETUR, 2010).

3.2.2 Revenue

With the defined use for each building, an estimate of expected revenue was made. The revenue was

demonstrated through demand studies and estimates of rental value or user fee charges. As the project will be managed by both the public and private sectors, the revenues were calculated in two ways:

- For the equipment managed by the private sector, revenue was estimated through rental calculations;
- For the equipment managed by the public sector, revenue was calculated through the implementation of social activities.

3.2.3 Result of the first year

Determined by the difference between the total sum of costs and the total sum of revenues obtained in the first year of operation of the enterprise.

3.3 Critical evaluation

3.3.1 Cost-benefít

The cost-benefit analysis presented globally, in efficiency prices, included the sum of the project's total benefits, comparing them to investment costs, operation, and maintenance costs, in a cash flow over 20 years, discounted at a rate of 12% (twelve percent) per annum. At the end, the results of the following indicators were provided: (i) Internal Rate of Return (IRR); (ii) Net Present Value (NPV) of the cash flow; and (iii) Benefit/Cost Ratio (B/C) of the project.

In this section, financial analysis was presented, which evaluates the liquidity ratios of an enterprise, i.e., its ability to meet its obligations, as well as the leverage ratios, which demonstrate the degree of indebtedness of the business. This type of analysis focuses on the company's cash flow, its expenses, revenues, and the composition of its budget, which can result in a positive or negative final diagnosis. Additionally, the analysis of the financial situation of the enterprise was also presented, with the proper determination of profits or losses incurred in a certain accounting period. In this analysis, profitability ratios are examined, showing the return on investments made by the company, as well as activity ratios, which demonstrate variations in the operational cycle of the business (KRUGER; ZANELLA; BARICHELLO, 2023).

Finally, the financial sustainability of the project was analyzed by presenting the investment costs, operation and maintenance costs, and revenues. For this stage of the project, three distinct sensitivity studies were conducted to observe the existence of variations in the feasibility diagnosis. The analyzed scenarios are enumerated as follows:

- Increase of 25% in the initial project investment value;
- Reduction of 20% in project revenues;
- Increase of 20% in operating costs.

3.3.2 Distributive Impact (DI)

It is important to understand the profile of the beneficiaries of a project. In the case of historical heritage recovery projects, the entire community benefits. Therefore, it was necessary to characterize this population from the perspective of family income, aiming to understand the participation of each economic group in the distribution of the project's economic benefits, particularly focusing on low-income beneficiaries.

The Distributive Impact Coefficient (DIC) was estimated according to item 5.1.4 of Appendix K of the Operational Regulation of the PRODETUR Program. According to the Operational Regulation of the PRODETUR Nordeste II Program, low-income population is defined as those whose family income is less than 5 (five) minimum wages. (PRODETUR, 2010).

3.4 Methodological Bases

The data sources feeding this research were produced by public agents, professional associations, non-governmental organizations, and surveys conducted with entrepreneurs. Regarding data used in bibliographic research, they were obtained from academic works by specialists, newspapers, specialized books, and conventional media.

The present research is a guideline for decision-making; however, it does not constitute a real guarantee, as an organization or enterprise is a social system subject to economic, social, political, demographic, and technological variables, which cannot be fully predicted and influence the dynamics of the enterprise. Thus, all planning, by its nature and contingent, is subject to periodic evaluations and eventual changes (FUNDARPE, 2009). Therefore, the research followed the following premises:

- the study was developed considering a temporal horizon of 20 years;
- the investment amount to be made was detailed in the budgets presented in the annex;
- the prices adopted in the construction budgets are market prices;

- the total investment values were calculated at market prices;
- the expected benefit is the appreciation of properties located within a radius of 100 meters from where the buildings of the enterprise are contained, according to the perimeter map attached. The current value adopted for these properties (R$ 3,023,417.09) is in accordance with the real estate register of the Municipality of Igarassu. The nominal list of properties is attached;
- a representative interest rate of 12% per year was adopted as the opportunity cost of invested capital, which was used as the discount rate for the analyses conducted;
- The costs associated with ambiance investment (furniture, utensils, equipment) will be the responsibility of the lessees and are not considered in the present project;
- The management of the enterprise will be carried out by the Foundation for Historical and Artistic Heritage of Pernambuco (FUNDARPE), the owner of the cultural center. The administration of the equipment will be carried out by third parties through public tender, with the exception of the Cachaça Museum and the multipurpose space, which will be the responsibility of the public sector;
- Whenever necessary, financial updates and corrections were made using the National Construction Cost Index (INCC), following Equation 1 for determining the adjusted value.

$$R = \frac{li - lo}{lo \times V}$$

Where:

R= Adjusted value (R$)

lo= Price index verified in the month of the opening of the bidding process or the proposal for the private work.

li= Price index for the month of January/2023

V= Construction cost (R$)

4. RESULTS OBTAINED

4.1 Costs

4.1.1 Investiments

The estimated investment value was calculated using the cost estimation method, which is an approximate assessment of costs for the execution of an engineering project. The results of a cost estimate are based on previous projects. In other words, they are based on similar works previously carried out in the same region (KIEZA, 2023). That said, the estimated investment value was based on the investment value of the Engenho São João project. (FUNDARPE, 2007). The redevelopment project of the Engenho São João was chosen because it has similar characteristics to the Engenho Monjope in terms of construction period, construction system, architectural aesthetics, and location. The values were updated using the INCC. Thus, the market value of the Engenho Monjope investment is R$ 6,041,102.93, as per Table 2 - Investment Estimate.

Engenho São João		Engenho Monjope	
Total Area	4,973,73 m²	Total Area	3.778,64 m²
Budget	R$ 7.951,742,52	Orçamento	R$ 6,041,102,93
Valor do m²	R$ 1,608,45	Valor do m²	R$ 1,598,75

Table 2: Investment Estimate

Source: Authors, 2024

4.1.2 Maintenance Costs

The cost of preventive maintenance for the set of buildings was calculated by averaging three quotes provided by building maintenance companies. The estimated total maintenance cost for the first year of the project amounted to R$ 33,116.00. at market values, as described inTable 3.

Annual maintenance cost	
Discrimination	**Value**
Financial Planning for Preventive and Corrective Maintenance	
Architectural physical structures	R$ 500.00
Hydrosanitary installations	R$ 400.00
Fire detection, prevention, and fighting installations	R$ 2,000.00
Air conditioning installations	R$ 6,000.00
Lighting and extra illumination installations	R$ 1,600.00
Physical structure of landscaping and arrangements	R$ 1,400.00
Electrician	R$ 4,896,00
Mason/plumber	R$ 4,896,00
Gardener	R$ 4,896,00
Assistants	R$ 6,528,00
Total	**R$ 33,116.00**

4.1.3 Operational Costs

For the calculation of operational costs, the assumptions described in the methodology were taken into consideration. The estimated values of annual operational costs were totaled at R$ 283,308.00 at market prices and are presented in Table 4. Operational costs for the use of all equipment were estimated using expenses from similar structures as a basis, along with consumption calculations. For salary calculations, the requirements of the CLT (Consolidation of Labor Laws) were considered, and the burden values were allocated monthly. Personnel involved in cleaning and maintenance comprise the maintenance cost, calculated by specialized professionals. Table 4 presents the detailed expenditure on annual payroll by function.

Annual Operational Cost			
Description	**Amount**	**Value**	**Total Value**
Manager	1	R$ 1,500.00	R$ 18,000.00
Security	6	R$ 800.00	R$ 57,600.00
Ticket seller	2	R$ 600.00	R$ 14,400.00
Engines	2	R$ 600.00	R$ 14,400.00
Support assistance	1	R$ 600.00	R$ 7,200.00
Energia Elétrica	-	-	R$ 42,000.00
Water	-	-	R$ 24,000.00
Miscellaneous expenses	-	-	R$ 16,308,00
Paper towel	-	-	R$ 4,320.00
Toilet paper	-	-	R$ 1,200.00
Cleaning supplies	-	-	R$ 9,600.00
Office supplies	-	-	R$ 3,000.00
Uniforms	-	-	R$ 600.00
Petty cash	-	-	R$ 6,000.00
Telephony	-	-	R$ 7,200.00
Accounting services	-	-	R$ 9,600.00
Fees	-	-	R$ 720.00
Transportation expenses	-	-	R$ 3,000.00
IPTU(Brazilian Tax)	-	-	R$ 10,200.00
Insurance	-	-	R$ 360.00
Reserves	-	-	R$ 33,600.00
Payroll	-	-	R$ 111,600.00
Total			**394,908.00**

Table 4: Annual operating cost
Source: Authors, 2024

4.2 Reveneus

The revenues were calculated in two ways: for the equipment managed by the private sector, revenue is estimated through the calculation of rents, and for the equipment managed by the government, revenue will be calculated through the hosting of social activities.

The government, through the state government, will assume the management of the activities of the equipment whose uses are social and commits to making transfers of financial and economic resources necessary to cover operational costs in addition to providing for depreciation and amortization of investment at an annual rate of 12%.

Note that, although it is the direct responsibility of the state government, the administrations of the lodging-school, professional training center, and school restaurant spaces may be transferred to other federal, state, or municipal public entities whose work is associated with each use.

Table 5 presents the project revenue from leasing to the private sector and from ticket sales. The values were calculated at market prices. Table 6 shows the total revenue obtained through budget allocation transfers from the state government for the social use of the space. The state government should establish a budget allocation fund to meet the demands arising from the execution and maintenance of this project.

It is worth noting that although the cachaça museum is a publicly used facility, it has been included in the revenue from private sources due to the possibility of its use for exhibitions by private companies in the field, as well as other events of various kinds, such as exhibitions and book launches. Similarly, the revenue from the multipurpose space, whose administration is associated with FUNDARPE, was calculated based on the rental of the area ten times a month, at a unit value of R$ 1,500.00. In this space, events such as theater performances, film screenings, concerts, graduation ceremonies, among others, are expected to take place. The calculation basis considered the revenue from similar spaces. Finally, Table 7 summarizes the project's annual revenues.

Equipment	Rent - monthly	Rent - annual
Cachaça museum	R$ 1,200.00	R$ 14,400.00
Cafeteria	R$ 700.00	R$ 8,400.00
Craft shop	R$ 500.00	R$ 6,000.00
Event area, chapel, and mini-center	R$ 6,000.00	R$ 72,000.00
Multipurpose Space	R$ 15,000.00	R$ 180.000.00
Revenue from ticket sales		
Full amount	R$ 2,178,00	R$ 26,136,00
Half-price ticket	R$ 1,089,00	R$ 13.068,00
Condominium revenue	R$ 2,950.00	R$ 35,400.00
Total	**R$ 29,617.00**	**R$ 355,404.00**

Table 5: Revenue from leasing to the private sector
Source: Authors, 2024

Usos	Monthly value	Annual value
Lodge-school	R$ 15,000.00	R$ 180,000.00
Professional training center	R$ 15,000.00	R$ 180,000.00
School restaurant	R$ 15,000.00	R$ 180,000.00
Total	**R$ 45,000.00**	**R$ 540,000.00**

Table 6: Transfers of budget allocation resources from the government for the social use of the space
Source: Authors, 2024

Total revenue in current prices	
Leasing to the private sector	R$ 355,404,00
Transfer of resources via budget allocation	R$ 540,000.00
Total revenue	**R$ 895,404.00**

Table 7: Total revenue in current prices
Source: Authors, 2024

4.3 Net Income

The Table 8 below presents the results of the first year of operation of the Project.

Net income	
Total revenue	R$ 895,404,00
Total costs [1]	R$ 316,424,00
Net income	**R$ 578,980.00**

Table 8: Net income
Source: Authors, 2024

4.4 Cost-Benefit Analyses

4.4.1 Financial Analysis

Table 9 presents the forecast of the annual cash flow of revenues and operating, administrative, and maintenance expenses of the equipment in current values. For the corrected calculation of the cost estimate over the period, the value of the inflation target established by the Central Bank of Brazil over the last five years was considered. This counting format is in accordance with what is established in similar estimates. The IGP-M was the index used to adjust annual revenues, as this price index is used in rent adjustments. For the projection, the average value of the index over the last five years was considered.

FINANCIAL ANALYSIS		
Revenues (Market prices)	**Operating, administrative, and maintenance costs (Marketprices)**	**Net Result (1-2)**
R$ 895,404.00	R$ 316,424.00	R$ 578,980.00
R$ 945,994.33	R$ 330,663.08	R$ 615,331.25
R$ 999,443.01	R$ 345,542.92	R$ 653,900.09
R$1,055,911.54	R$ 361,092.35	R$ 694,819,19
R$1,115,570.54	R$ 377,341.51	R$ 738,229.03
R$1,178,600.27	R$ 394,321.87	R$ 784,278.40
R$1,245,191.19	R$ 412,066.36	R$ 833,124.83
R$1,315,544.49	R$ 430,609.34	R$ 884,935,15
R$1,389,872.75	R$ 449,986.76	R$ 939,885,99
R$1,468,400.56	R$ 470,236.17	R$ 998,164.40
R$1,551,365,20	R$ 491,396,80	R$1,059,968,4
R$1,639,017.33	R$ 513,509.65	R$1,125,507,6
R$1,731,621.81	R$ 536,617.59	R$1,195,004,2
R$1,829,458.44	R$ 560,765,38	R$1,268,693,0
R$1,932,822.84	R$ 585,999.82	R$1,346.823,0
R$2,042,027.33	R$ 612,369.81	R$1,429,657,5
R$2,157,401.88	R$ 639,926.45	R$1,517,475,4
R$2,279,295,08	R$ 668,723.14	R$1,610.571,9
R$ 26,772,942.58	**R$ 8,497,593,00**	**R$ 18,275,349.58**

Table 9: Financial Analysis
Source: Authors, 2024

Table 10 presents the present values of revenues, investment costs, operating, administrative, and maintenance costs, and net results discounted at an annual rate of 12%. Note that the investment value was divided into two parts considering that 40% of the redevelopment work will be carried out in the first year and the remaining part will be carried out in the second year.

Year	Receita Valor Presente	Custos de Operação, administração e manutenção Valor Presente	Resultado Líquido (1-2)
Year 01	-	R$ 2,368,176,13	R$ 2,368,176,1
Year 02	-	R$ 3.171,664,46	R$ 3.171,664,4
Year 03	R$ 799,467,8	R$ 282,521,43	R$ 1,081,989,2
Year 04	R$ 754,140.8	R$ 263.602,58	R$ 1,017,743,4
Year 05	R$ 711,383,7	R$ 245,950.62	R$ 957,334,41
Ano 06	R$ 671,050.8	R$ 229,480.72	R$ 900.531,59
Year 07	R$ 633.004,6	R$ 214,113,70	R$ 847,118,39
Year 08	R$ 597,115,5	R$ 199,775,73	R$ 796,891,31
Year 09	R$ 563.261,2	R$ 186,397,89	R$ 749,659,15
Year 10	R$ 531,326,3	R$ 173.915,89	R$ 705,242,25
Year 11	R$ 501,202,0	R$ 162,269,74	R$ 663.471,79
Year 12	R$ 472,785,6	R$ 151,403,46	R$ 624,189,14
Year 13	R$ 445,980.4	R$ 141,264,84	R$ 587,245,26
Year 14	R$ 420.694,9	R$ 131,805,14	R$ 552,500.06
Year 15	R$ 396,843,0	R$ 122,978,90	R$ 519,821,93
Year 16	R$ 374,343,4	R$ 114,743,71	R$ 489,087,15
Year 17	R$ 353.119,5	R$ 107,059,98	R$ 460.179,48
Year 18	R$ 333.098,	R$ 99,890.78	R$ 432,989,67
Year 19	R$ 314,213,3	R$ 93.201,67	R$ 407,415,04
Year 20	R$ 296,398,6	R$ 86,960.48	R$ 383.359,08
Total	**R$ 9,169,431, 19**	**R$ 8,547,177,85**	**R$ 622,253,35**

Table 10: Financial analysis
Source: Authors, 2024

Through the analysis of Table 11, it can be seen that the project presents a negative Net Present Value (NPV) of R$ 461,007.69, which renders the project financially unviable by the NPV criterion. Therefore, it is not possible to calculate the Internal Rate of Return (IRR), making the project unfeasible.

It should be emphasized that this unfeasibility is associated with the characteristics of the intended uses for the Engenho. Therefore, it is necessary to provide additional financial resources for the operation and maintenance of the project.

4.4.2 Economic Analysis

Considering the assumptions presented above, the indicator adopted for the viability of the project is the comparison of the investment cost with the Net Present Value (NPV) of the discounted cash flow added to the real estate appreciation in the vicinity of Engenho Monjope of 10% in the first year of operation, in addition to the calculation of the Internal Rate of Return (IRR) of the investment. The Table

11 presents the real estate appreciation in market values and present values, as well as in price-efficiency. It is worth noting that the present value uses a discount rate of 12%. It is also noted that to calculate the real estate appreciation in terms of price-efficiency, the product between the market value and the standard conversion factor (0.94) was used. Table 12 shows the cash flow in current values, and Table 13 presents the cash flow in terms of present value, with costs calculated in terms of price-efficiency. It is mentioned here that the real estate appreciation value calculated in column 1 of the table refers to the discounted price-efficiency value for year zero.

Year	Real Estate apreciation		Real Estate apreciation
	Current Value	Presente value	Efficiency Prices
Year 01	-		-
Ano 02	-		-
Year 03	R$ 302,341,7	R$ 215,200.8	R$ 284.201,20
Total	**R$ 302,341,7**	**R$ 215,200.8**	**R$ 284,201,20**

Table 11: Economic Analysis
Source: Authors, 2024

Year	Revenues (Market Prices)	Operating, administrative, and maintenance costs (Market Prices)	3 - Net Result (1-2)
Year 01	-	-	-
Year 02	-	-	-
Year 03	R$ 302,341,7	R$ 316,424,00	R$ 14,082,30
Year 04	-	R$ 330.663,08	R$ 330.663,08
Year 05	-	R$ 345,542,92	R$ 345,542,92
Year 06	-	R$ 361.092,35	R$ 361,092,35
Year 07	-	R$ 377,341,51	R$ 377,341,51
Year 08	-	R$ 394,321,87	R$ 394,321,87
Year 09	-	R$ 412,066,36	R$ 412,066,36
Year 10	-	R$ 430.609,34	R$ 430.609,34
Year 11	-	R$ 449,986,76	R$ 449,986,76
Ano 12	-	R$ 470.236,17	R$ 470.236,17
Year 13	-	R$ 491.396,80	R$ 491,396,80
Year 14	-	R$ 513.509,65	R$ 513.509,65
Year 15	-	R$ 536,617,59	R$ 536,617,59
Year 16	-	R$ 560.765,38	R$ 560.765,38
Year 17	-	R$ 585,999,82	R$ 585,999,82
Year 18	-	R$ 612,369,81	R$ 612,369,81
Year 19	-	R$ 639,926,45	R$ 639,926,45

Year 20	-	R$ 668,723,14	R$ 668,723,14
Total	**302,341,70**	**R$ 8,497,593,00**	**R$ 8,195,251,30**

Table 12: Cash flow
Source: Authors, 2024

Year	Revenues Efficiency Prices	Operating, administrative and maintenance costs Efficiency Prices	Net Result (1-2)
Year 01	-	R$ 1,830.011,47	R$ 1,830.011, 47
Year 02	-	R$ 2,450.908,21	R$ 2,450.908, 21
Year 03	R$ 212,288,80	R$ 241,113,00	R$ 28,824,20
Year 04	-	R$ 224,967,04	R$ 224,967,04
Year 05	-	R$ 209,902,28	R$ 209,902,28
Year 06	-	R$ 195,846,32	R$ 195,846,32
Year 07	-	R$ 182,731,61	R$ 182,731,61
Year 09	-	R$ 159,078,04	R$ 159,078,04
Year 10	-	R$ 148,425,49	R$ 148,425,49
Year 11	-	R$ 138,486,28	R$ 138,486,28
Year 12	-	R$ 129,212,65	R$ 129,212,65
Year 12	-	R$ 129,212,65	R$ 129,212,65
Year 13	-	R$ 120.560.02	R$ 120.560.02
Year 14	-	R$ 112,486,80	R$ 112,486,80
Year 15	-	R$ 104,954,20	R$ 104,954,20
Year 16	-	R$ 97,926,02	R$ 97,926,02
Year 17	-	R$ 91,368,47	R$ 91,368,47
Year 18	-	R$ 85,250.05	R$ 85,250.05
Year 19	-	R$ 79,541,34	R$ 79,541,34
Year 20	-	R$ 74,214,91	R$ 74,214,91
Total	**212,288,80**	**R$ 2,566,559,65**	**R$ 2,354,270. 85**

Table 13: Cash flow
Source: Authors, 2024

Through the analysis of Table 11, it can be seen that the project presents a negative Net Present Value (NPV) of R$ 2,354,270.85, which indicates that it does not meet the established criteria. It is also noted that, given the negative NPV result, the NPV criterion analysis method becomes unviable. It is worth noting that the project will be carried out in the rural area of the Municipality of Igarassu, and therefore, real estate appreciation had a minimal effect on economic viability. We conclude by informing that most of the established uses were of a social nature, which generates significant social benefits for the population of the Mata Norte Pernambucana.

4.4.3 Sensitivity Financial Analysis

In this stage, three possible scenarios were simulated to verify if the project's viability would be affected by changes in some of these items. In the first scenario, the impact of a 25% increase in the investment value was

analyzed. Next, the scenario was observed when there is a 20% reduction in revenue in present values. Finally, the economic scenario was observed in the presence of a 20% increase in administrative, operating, and maintenance costs of the project. The results of the possible scenarios are presented in Table 14.

Present value in scenario I	
Investiments	**Net profit for the period**
R$ 7,551,378,66	- R$ 1,540.284,71
Present value in scenario II	
Investments	**Net profit for the period**
R$ 6,041,102,93	- R$ 1,592,232,63
Present value in scenario III	
Investments	**Net profit for the period**
R$ 6,041,102,93	- R$ 359,813,84

Table 14: Present values in scenarios I, II, and III
Source: Authors, 2024

Through the analysis of the above Tables, it can be observed that any changes in one of the analyzed scenarios could lead the project to economic and financial unfeasibility. Thus, the importance of project management and control is reaffirmed.

4.4.4 Distributive Impact - Distributive Impact Coefficient (DIC)

In order to analyze the impact caused by the investment on families with income of up to five minimum wages, the Distributive Impact Coefficient (DIC) was calculated. The DIC measures the benefit of the project for low-income individuals relative to the total number of beneficiaries in the project (PRODETUR, 2010).

After the coefficient calculations, it is observed that the fraction of low-income beneficiaries (0.928) is quite considerable when compared to the total number of beneficiaries. Thus, the social importance of the proposed intervention is reaffirmed, ensuring that this city is in need of investments of this magnitude.

5. FINAL CONSIDERATIONS

In the governmental scope, few studies have been able to demonstrate the economic impact of investment in tourism activity, crucial information for destinations that intend to use tourism as an important sector.

A scarcity of economic resources combined with the numerous problems caused by poverty in the Brazilian Northeast makes it essential to seek maximum efficiency in the allocation of public investments in the region. Thus, ongoing concerns and discussions of modern society have contributed to stimulating debate and emphasizing the need to achieve sustainable development.

Tourism is one of the activities that has stood out in recent times, not only for significantly contributing to the growth of the global economy but also for providing development for the various regions that harness existing potential.

The present work presented a study of economic and financial feasibility for the redevelopment of Engenho Monjope, taking into consideration multiple sources of revenue and various costs. It has also been demonstrated that the project is viable in social and financial aspects, both in terms of cost-benefit and the Distributive Impact Coefficient (DIC).

The presented result is entirely linked to the manager's performance in achieving the revenue, cost, investment, and maintenance goals proposed in the study. The qualification, attitude, decisions, and performance of the manager directly influence the results of the project. Therefore, periodic evaluations of the performance achieved and comparison with the expected result are suggested to correct any shortcomings.

The Engenho Monjope is one of the few sugar mills that has all the elements of a colonial mill — the main house, slave quarters, mill, chapel, bushes, the house of the "captain of the woods" and other smaller elements. Restoration is necessary to bring it up to modern societal demands. It is indeed a historical heritage of notable importance to the history of Brazil, and it has the potential to make history again. Therefore, through the study in question, it was possible to conclude that the redevelopment project is completely viable, both financially and economically. Thus, it is concluded that

economic and financial feasibility studies are crucial to ensuring the success of projects located in historic sites.

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