

Preliminary Sustainability Assessment of San Jose De Buenavista Public Market

DOI: 10.5281/zenodo.17410903

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Abstract:

This study assessed the sustainability performance of the San Jose de Buenavista Public Market in Antique, Philippines, using the Building for Ecologically Responsive Design Excellence (BERDE) Green Building Rating System as the evaluation framework. Employing a descriptive–evaluative research design, the study examined the market’s compliance with six BERDE core categories—Use of Land and Ecology, Energy, Water, Waste, Materials, and Emissions. Data were gathered from 90 respondents representing market tenants, goers, and administrators through survey questionnaires, supplemented by site observations and document reviews. Descriptive statistics, including weighted mean and standard deviation, were used to determine sustainability performance levels. Results revealed that the market achieved only 13 out of 42 possible BERDE points, indicating a below-standard level of sustainability. The highest performance was recorded in Use of Land and Ecology due to site accessibility and adequate lighting, while the lowest scores were found in Waste and Emissions categories, reflecting deficiencies in solid waste segregation, air quality management, and greenhouse gas monitoring. Stakeholder responses highlighted issues of cleanliness, spatial organization, and environmental management as areas needing improvement. The findings underscore the need for the Local Government Unit (LGU) to integrate green building strategies—such as renewable energy systems, water reuse technologies, waste management programs, and green procurement policies—into market redevelopment. This assessment serves as a baseline for future BERDE certification efforts and contributes to promoting sustainable public architecture aligned with the Philippine Green Building Code and the United Nations Sustainable Development Goals (SDGs).

Keywords: BERDE, sustainable architecture, public market, green building assessment, San Jose de Buenavista, environmental design, sustainability in the Philippines

Introduction:

The global built environment is increasingly under scrutiny as nations grapple with climate change, rapid urbanization, and unsustainable patterns of consumption. Buildings alone contribute nearly 40% of global greenhouse gas emissions, with energy use and material production being major sources of impact (Global Alliance for Buildings and Construction, & United Nations Environment Programme (UNEP), 2023). This makes the construction and operation of buildings central to discussions on sustainability and climate action. In line with the United Nations Sustainable Development Goals (SDGs), sustainable architecture is not simply an environmental concern but also a social and economic imperative (Abraham et al., 2022). The urgency of rethinking how buildings are designed, constructed, and managed is particularly relevant in developing countries like the Philippines, where infrastructure plays a critical role in shaping urban life and economic growth (Siman, 2023).

One response to these challenges has been the rise of ecological and sustainable design frameworks. Ecological Responsive Design emphasizes integration between architecture and natural systems by minimizing environmental damage while enhancing user well-being (Grobman et al., 2023). These frameworks, however, are not without limitations. While they promise reduced energy use and improved environmental performance, critics note that green certifications can sometimes be pursued more for branding and compliance rather than genuine sustainability outcomes (Doan et al., 2017). Such debates highlight the importance of context-sensitive application of sustainability frameworks, especially in public-use buildings that serve diverse stakeholders.

The Architecture, Engineering, and Construction (AEC) industry faces particular pressure to innovate. Rising energy costs, limited natural resources, and climate-induced risks push this sector toward adopting low-carbon and resource-efficient practices (Piroozfar & Farr, 2024). In response, a range of green building rating systems has emerged worldwide, including LEED (USA), BREEAM (UK), and Green Star (Australia), each providing structured ways of assessing sustainability (Felicioni et al., 2023). In the Philippines, the Building for Ecologically Responsive Design Excellence (BERDE) system was developed by the Philippine Green Building Council to serve as a localized framework that reflects both global standards and local realities (Philippine Green Building Council, 2009).

BERDE is notable for its comprehensive approach, addressing categories such as land use and ecology, energy, water, waste, materials, transportation, and emissions. Unlike international systems that may be cost-prohibitive or culturally distant, BERDE seeks to be contextually appropriate, affordable, and aligned with local building codes

(Culiao et al., 2018). Despite its potential, however, BERDE adoption has so far been concentrated in private commercial buildings in Metro Manila and other highly urbanized areas. Few public buildings have undergone BERDE certification, and public markets in particular remain largely unassessed within this framework.

Public markets occupy a distinctive place in Philippine urban life. Beyond being centers of commerce, they embody cultural practices, social interactions, and local economies (Morales, 2009, Carmen et al., 2020). They are also facilities heavily used by lower- and middle-income communities, making their sustainability not only an architectural concern but also a matter of social equity. Yet, many public markets in the country are plagued by overcrowding, inadequate waste management, poor ventilation, and aging infrastructure (Ekomadyo & Triwardhani, 2024). These issues not only diminish user comfort but also erode competitiveness in the face of modern malls and supermarkets, which often attract wealthier consumers with cleaner and more controlled environments.

This situation presents both opportunities and challenges. On one hand, redesigning public markets according to sustainability principles could revitalize them as hubs of inclusive local economies, attract a broader clientele, and reduce their ecological footprint. On the other hand, the implementation of green standards in public facilities faces barriers such as budget limitations, lack of technical expertise, and the complexity of retrofitting old structures (Chan et al., 2018). The tension between these potentials and limitations makes the sustainability assessment of public markets a pressing yet underexplored research area.

San Jose de Buenavista Public Market, located in Antique province, exemplifies this tension. It is a vital commercial complex supporting thousands of residents and traders, yet it struggles with infrastructural and environmental challenges common to Philippine markets. Despite being a focal point of local economic activity, it has not been assessed against green building frameworks like BERDE. Conducting a preliminary sustainability assessment here provides an important test case: Can a public market in a provincial capital meet or move toward BERDE standards, and what redesigns or interventions would be necessary to do so?

At present, most BERDE-certified projects in the Philippines are high-end corporate or mixed-use buildings, leaving public-use facilities like markets absent from the certification landscape (Culiao et al., 2018). This gap reflects a broader inequity in sustainability discourse: while wealthier institutions can afford certification, essential community infrastructure often remains overlooked. Assessing the San Jose de Buenavista Public Market thus addresses both a scholarly and practical gap—bringing attention to the sustainability of everyday public facilities and testing the applicability of BERDE beyond elite contexts.

Furthermore, assessing markets aligns with broader policy frameworks. The Philippine Green Building Code of 2015, a referral code of the National Building Code (P.D. 1096), mandates resource efficiency, indoor environmental quality, and site sustainability in new developments (National Building Code of the Philippines, 1977). However, enforcement remains uneven, particularly for existing government-owned facilities. Embedding markets within sustainability initiatives could support compliance with national laws while contributing to the SDGs, specifically Goal 11 (Sustainable Cities and Communities) and Goal 12 (Responsible Consumption and Production) (Le, 2024).

Finally, a sustainability assessment of public markets has implications for resilience and inclusivity. As climate-related disasters intensify in the Philippines, public facilities need to be more resilient to flooding, heat, and other risks. At the same time, markets must remain accessible, affordable, and culturally relevant. By applying BERDE's categories—land use and ecology, energy, water, waste, materials, and emissions—this study seeks to bridge ecological responsiveness with socio-economic realities, ensuring that sustainability is not only about environmental performance but also about enhancing community well-being.

In response to these identified gaps in public market sustainability, this study aimed to conduct a preliminary sustainability assessment of the San Jose de Buenavista Public Market in Antique, Philippines, using the Building for Ecologically Responsive Design Excellence (BERDE) Green Building Rating System. Specifically, it sought to evaluate the market's current sustainability performance based on six BERDE core categories—Use of Land and Ecology, Energy, Water, Waste, Materials, and Emissions—identify aspects of the structure that require redesign or improvement to meet preliminary certification standards, and determine the sustainability-related perceptions and needs of key stakeholders, including market tenants, goers, and administrators. The findings were intended to serve as the basis for recommending architectural and operational strategies that would guide the Local Government Unit of San Jose de Buenavista in aligning future market redevelopment with the Philippine Green Building Code and the United Nations Sustainable Development Goals (SDGs).

Methodology:

This study employed a descriptive–evaluative research design to conduct a preliminary sustainability assessment of the San Jose de Buenavista Public Market using the Building for Ecologically Responsive Design Excellence (BERDE) Green Building Rating System. The descriptive–evaluative approach was appropriate for determining the present condition of the facility relative to established green building indicators and for identifying the areas that require improvement to align with sustainability standards (Creswell & Creswell, 2017). The research did not aim to test

hypotheses but rather to document existing conditions, measure them against BERDE criteria, and interpret findings within the framework of sustainable architecture and environmental performance.

The study was conducted in San Jose de Buenavista, the capital town of Antique Province in the Western Visayas region of the Philippines. The municipality is an emerging commercial and administrative center with a tropical climate characterized by high humidity and distinct wet and dry seasons, conditions that influence the design and operation of buildings. The San Jose de Buenavista Public Market, locally known as San Jose Tradetown, occupies approximately 6.5 hectares and serves as the primary hub for local trade, public transport, and community interaction. The site's scale, socio-economic significance, and existing infrastructure make it a suitable case for evaluating sustainability performance under the BERDE framework.

Three stakeholder groups were purposively selected to ensure comprehensive perspectives on the market's sustainability performance: (1) market tenants who occupy and operate stalls, (2) market goers or consumers who use the facility, and (3) market administrators who oversee management and maintenance. A purposive sampling technique was adopted because respondents needed to have direct experience with the market's operations and environment (Etikan, 2017). Following guidelines for small-population surveys (Israel, 2009), a total of 90 respondents were included: 60 tenants, 25 market goers, and 5 administrators. This distribution reflected both the population structure of the market and the diversity of user experiences.

Data were collected through a structured survey questionnaire developed from the BERDE Core Framework categories: Use of Land and Ecology, Energy, Water, Waste, Materials, and Emissions (Philippine Green Building Council, 2009). Each category was operationalized into measurable indicators assessed on a five-point Likert scale ranging from 1 = Poor to 5 = Excellent. The instrument included both quantitative ratings and open-ended questions to capture qualitative insights about environmental practices, comfort, and management policies. Complementary on-site observations and document reviews (e.g., architectural plans, maintenance logs, local ordinances) were conducted to triangulate survey data and enhance the credibility of findings (Carter et al., 2014).

To ensure content validity, the questionnaire underwent expert review by three professionals in architecture, environmental planning, and sustainability assessment who evaluated the alignment of each item with BERDE indicators. Their feedback led to revisions in terminology and sequencing. Pilot testing was conducted with 15 respondents from a comparable local market to determine clarity and timing. Reliability was established using Cronbach's alpha, which yielded an overall coefficient of 0.87, indicating high internal consistency (Tavakol & Dennick, 2011). These procedures ensured that the instrument was both valid for measuring sustainability indicators and reliable for replication.

Prior to data collection, formal coordination was made with the Local Government Unit (LGU) of San Jose de Buenavista and the market administrator to secure permission to conduct the study. Upon approval, the researcher personally administered the questionnaires during the months of March to May 2025. Respondents were briefed on the purpose of the research, informed of their voluntary participation, and assured of confidentiality. Observational data were recorded through site visits, photographs, and field notes, while relevant documents were obtained through the LGU's planning and engineering offices. All responses were encoded, verified, and stored securely for analysis.

Quantitative data from the Likert-type items were analyzed using descriptive statistics, specifically the weighted mean and standard deviation, to summarize the sustainability performance of the market in each BERDE category. The mean scores were interpreted according to predetermined ranges to classify sustainability levels (e.g., 1.00–1.80 = Poor, 1.81–2.60 = Fair, 2.61–3.40 = Good, 3.41–4.20 = Very Good, 4.21–5.00 = Excellent). Comparative analyses across stakeholder groups were performed using one-way ANOVA to determine significant differences in perception. Qualitative responses and observational notes were thematically summarized to provide contextual explanations of quantitative results (Miles et al., 2018).

Ethical standards were strictly observed throughout the research. Approval and clearance were obtained from the Institutional Research Ethics Committee of La Consolacion College Bacolod prior to data collection. All participants provided informed consent, acknowledging that participation was voluntary and that they could withdraw at any time without penalty. No personal identifiers were recorded in the dataset. Data were handled following the principles of confidentiality, beneficence, and respect for persons as outlined in the Philippine Health Research Ethics Board (2022). The study avoided any conflict of interest and ensured that findings would be reported accurately and objectively.

Results:

This section presents the results of the preliminary sustainability assessment of the San Jose de Buenavista Public Market based on the six core categories of the Building for Ecologically Responsive Design Excellence (BERDE) Philippine Green Building Rating System. Each category—Use of Land and Ecology, Energy, Water, Waste, Materials,

and Emissions—was evaluated to determine compliance with BERDE indicators. The findings also integrate stakeholder perspectives on design considerations, facilities, and features of the public market.

Use of Land and Ecology

The assessment revealed mixed performance in the Use of Land and Ecology category (Table 1). Among the three sub-frameworks, Light Pollution Reduction (LE-09) met the standard, while Certified Green District (LE-04) and Ecological Features Improvement (LE-05) did not.

Table 1. BERDE Framework No. 1 – Use of Land and Ecology

	Required Score	Pursued Score	Verbal Interpretation
LE-04 Certified Green District	3	0	Did not meet the standard
LE-05 Ecological Features Improvement	3	1	Partially met the standard
LE-09 Light Pollution Reduction	3	3	Met the standard
Total	9	4	

The market is not located in a certified green district, limiting its potential for environmental certification benefits. However, the presence of native trees such as mahogany, talisay, and kamagong supports partial ecological enhancement. The use of downward LED lighting and solar floodlights indicates compliance with light pollution standards, contributing to energy savings and better illumination quality.

Energy

As shown in Table 2, the public market did not fully meet BERDE energy requirements. While Energy Consumption Reduction (EN-01) demonstrated partial compliance, Renewable Energy (EN-02) scored zero due to the absence of solar or other renewable systems.

Table 2. BERDE Framework No. 2 – Energy

	Required Score	Pursued Score	Verbal Interpretation
EN-01 Energy Consumption Reduction	3	3	Did not meet the standard
EN-02 Renewable Energy	3	0	Did not meet the standard
Total	6	3	

Although natural ventilation, skylights, and insulated roofing reduce dependence on mechanical cooling, the market still relies solely on grid electricity from the Antique Electric Cooperative (ANTECO). The absence of on-site renewable energy limits its environmental performance and resilience to power interruptions.

Water

Table 3 shows that water sustainability practices remain inadequate. Only Rainwater Harvesting (WT-03) met the standard, while Water Consumption Reduction (WT-01) and Graywater Reuse (WT-02) did not.

Table 3. BERDE Framework No. 3 – Water

	Required Score	Pursued Score	Verbal Interpretation
WT-01 Water Consumption Reduction	3	0	Did not meet the standard
WT-02 Graywater Reuse	3	0	Did not meet the standard
WT-03 Rainwater Harvesting	3	3	Met the standard
Total	9	3	

The presence of an overhead water tank and basic plumbing systems supports daily market operations, but water-efficient fixtures and reuse systems are absent. The existing rainwater harvesting system provides supplementary water for cleaning and flushing, showing a potential area for expansion toward comprehensive water reuse.

Waste

Waste management practices scored the lowest among all BERDE categories (Table 4). The Waste Management (WS-01) sub-framework received zero, indicating a lack of segregation, proper disposal systems, and waste treatment facilities.

Table 4. BERDE Framework No. 4 – Waste

	Required Score	Pursued Score	Verbal Interpretation
WS-01 Waste Management	3	0	Did not meet the standard
Total	3	0	

Unsegregated and scattered waste, poor drainage, and the absence of composting or recycling systems highlight the need for an integrated solid waste management program. This deficiency not only affects the market's environmental sustainability but also poses risks to public health and sanitation.

Materials

Table 5 summarizes performance under the Materials framework. The market met the Local Procurement (MT-02) requirement but failed to comply with Green Procurement (MT-01) and Community-Based Enterprise Procurement (MT-03) standards.

Table 5. BERDE Framework No. 5 – Materials

	Required Score	Pursued Score	Verbal Interpretation
MT-01 Green Procurement	3	0	Did not meet the standard
MT-02 Local Procurement	3	3	Met the standard
MT-03 Community-Based Enterprise Procurement	3	0	Did not meet the standard
Total	9	3	

Local sourcing of materials such as bamboo, sand, gravel, and paver blocks supports community livelihoods and reduces transport-related emissions. However, the absence of eco-labeled products and materials with low VOC content indicates opportunities for adopting green procurement practices.

Emissions

The market did not meet the BERDE requirements for emissions control (Table 6). Both Greenhouse Gas Inventory (EM-01) and Refrigerant Use (EM-02) scored zero due to the lack of monitoring systems and the continued use of freon-based refrigerants.

Table 6. BERDE Framework No. 6 – Emissions

	Required Score	Pursued Score	Verbal Interpretation
EM-01 Greenhouse Gas Inventory	3	0	Did not meet the standard
EM-02 Refrigerant Use	3	0	Did not meet the standard
Total	6	0	

This result reflects the absence of climate accountability mechanisms and the need for non-ozone-depleting refrigerants. Incorporating monitoring and low-GWP systems would align the market with current environmental policies.

Stakeholder Assessment of Market Design

Survey results from 90 respondents (60 tenants, 25 market-goers, and 5 administrators) showed strong consensus that the market requires major improvement in infrastructure and environmental management.

Table 7. Assessment of the Public Market

	Frequency	Proportion
Excellent	23	5.20%
Average	88	19.70%
Needs Improvement	335	75.10%
Total	446	100%

A majority (75.1%) of respondents rated the market as needing improvement, particularly in cleanliness, orderliness, waste management, and ventilation. Table 8 details the specific issues identified.

Table 8. Issues in Current Market Condition

	Frequency	Proportion
Orderliness	196	43.90%
Cleanliness	270	60.50%
Spaciousness	187	41.90%
Odor	236	52.90%
Waste Management	277	62.10%
Others	49	11.00%

Respondents cited waste management (62.1%) and cleanliness (60.5%) as the top concerns. These align with the low BERDE Waste category score and reinforce the urgency for systematic waste segregation and facility redesign.

Summary of Sustainability Performance

Overall, the San Jose de Buenavista Public Market achieved only 13 out of 42 possible BERDE points, reflecting a preliminary rating below standard. While partial compliance was achieved in areas such as local procurement, rainwater harvesting, and light pollution reduction, significant gaps exist in waste management, renewable energy use, and emissions monitoring. Stakeholder perceptions confirm that design and facility conditions remain below optimal standards, underscoring the need for immediate architectural and operational interventions.

Table 9. Summary of BERDE Assessment Results

	Required Score	Pursued Score	Performance
Use of Land and Ecology	9	4	Partially met
Energy	6	3	Below standard
Water	9	3	Below standard
Waste	3	0	Below standard
Materials	9	3	Partially met

Emissions	6	0	Below standard
Total	42	13	Below standard

Interpretation

The results highlight the public market's limited alignment with BERDE sustainability indicators. While the market demonstrates some positive features—such as daylighting, native vegetation, and rainwater harvesting—it lacks integrated environmental systems that characterize sustainable public buildings. The findings provide a crucial evidence base for redesign proposals aimed at improving performance in waste management, renewable energy adoption, and water efficiency, thereby advancing toward BERDE preliminary certification.

Discussion:

The preliminary sustainability assessment of the San Jose de Buenavista Public Market revealed that while the facility exhibits isolated strengths—particularly in land use, ecological lighting, and rainwater collection—its overall performance remains below the BERDE standard. These findings confirm that the country's public markets, despite their socio-economic importance, continue to lag behind private sector developments in terms of sustainable design and environmental performance.

The market's favorable score in Use of Land and Ecology reflects efficient site utilization and accessibility, attributes consistent with sustainable urban development principles under SDG 11, Sustainable Cities and Communities (Goubran & Cucuzzella, 2019; Independent Group of Scientists, 2023). Its proximity to transport terminals supports low-carbon mobility and community connectivity. However, the absence of landscaped areas and biodiversity features highlights a persistent gap between economic functionality and ecological integration. As Grobman et al. (2023) explain, ecological design should not merely coexist with human infrastructure but create mutual benefits between the built and natural environments. Introducing vegetated buffers, permeable pavements, and micro-green spaces would help the market move toward this goal and mitigate flooding common in tropical contexts like Antique.

Energy assessment results show partial adherence to BERDE's energy efficiency standards, with traditional lighting gradually being replaced by LEDs but no renewable energy integration. This pattern mirrors national trends, where renewable adoption in public infrastructure remains low due to limited capital and technical expertise (Chan et al., 2018). According to the Global Alliance for Buildings and Construction and the UNEP (2023), buildings are responsible for almost 40 percent of global CO₂ emissions, emphasizing that energy transition is the most crucial step toward sustainability. Although natural ventilation and daylighting provide passive advantages, a structured energy management plan and the introduction of photovoltaic systems could significantly reduce operational costs and emissions for the local government.

Water-related findings reveal that while rainwater harvesting is practiced, the absence of graywater reuse and efficient plumbing undermines long-term water sustainability. The Philippine Green Building Code (National Building Code of the Philippines, 1977) mandates resource efficiency through water-saving measures, yet compliance in provincial facilities is inconsistent. As Le (2024) observes, uneven enforcement of building regulations hampers the realization of national sustainability goals. Upgrading to low-flow fixtures and integrating treated graywater systems would strengthen the market's compliance with BERDE (WT-01 to WT-03) and contribute to SDG 6, Clean Water and Sanitation.

Waste management scored the lowest across all categories, aligning with stakeholder feedback identifying cleanliness and waste disposal as the most pressing concerns. Similar challenges have been documented in other Southeast Asian markets, where inadequate segregation and waste infrastructure lead to sanitation and odor problems (Ekomadyo & Triwardhani, 2024). Public markets typically generate organic waste from food and perishables, suggesting that composting and waste-to-resource programs could be effective interventions. Establishing clear waste segregation protocols, collection schedules, and composting areas would not only address hygiene but also align with SDG 12, Responsible Consumption and Production.

The Materials category showed moderate performance due to local procurement practices but limited use of certified green materials. Using locally sourced sand, gravel, and bamboo reduces transportation emissions and supports the local economy, which resonates with BERDE's call for community-based procurement (Culiao et al., 2018). Nonetheless, the lack of eco-labeled materials and life-cycle assessment demonstrates that cost considerations still outweigh environmental ones in local government projects. As Piroozfar and Farr (2024) note, balancing affordability with sustainability requires institutionalizing procurement policies that prioritize long-term environmental and health gains over immediate expense savings.

Emissions performance was the weakest aspect, reflecting the absence of greenhouse-gas inventory or air-quality monitoring. Refrigerants in cold storage areas likely still use ozone-depleting substances, contravening global calls to phase out high-GWP gases (Global Alliance for Buildings and Construction & UNEP, 2023). Improving ventilation,

switching to low-VOC materials, and adopting low-emission refrigerants are practical steps for reducing both operational and embodied carbon. Morales (2009) emphasizes that markets, as daily community environments, must maintain air quality to preserve both public health and social interaction—factors often overlooked in infrastructure planning.

Stakeholder assessments corroborate the quantitative results: three-quarters of respondents judged the market as needing major improvement, particularly in cleanliness, orderliness, and waste control. These perceptions reveal that sustainability extends beyond technical compliance; it involves user satisfaction, accessibility, and cultural identity (Carmen et al., 2020). Sustainable redesign should therefore merge environmental objectives with social inclusivity—ensuring that market vendors, consumers, and administrators all benefit from improved comfort, safety, and economic opportunity.

Overall, the market achieved only 13 of 42 possible BERDE points, a performance that situates it within the below-standard category. This outcome mirrors the findings of Culiao et al. (2018), who observed that BERDE adoption is concentrated in private commercial projects due to the financial and administrative demands of certification. The results demonstrate the urgency for local governments to mainstream sustainability frameworks into public infrastructure design and renovation. Integrating BERDE principles during the planning phase, rather than post-construction, could yield higher compliance and cost-efficiency.

Ultimately, the case of the San Jose de Buenavista Public Market underscores the dual challenge of promoting ecological responsiveness while maintaining affordability and functionality in community spaces. Addressing these challenges requires coordinated policy enforcement, stakeholder participation, and architectural innovation that aligns with the Philippine Green Building Code and the United Nations SDGs. Through incremental interventions—such as rainwater reuse, renewable-energy retrofits, improved waste management, and biophilic design—the market can evolve into a replicable model of sustainable public architecture in provincial contexts.

Conclusion:

This study assessed the sustainability performance of the San Jose de Buenavista Public Market based on the six core categories of the Building for Ecologically Responsive Design Excellence (BERDE) framework: Use of Land and Ecology, Energy, Water, Waste, Materials, and Emissions. The findings revealed that while the market demonstrates isolated strengths—particularly in accessibility, local material sourcing, and rainwater harvesting—its overall rating of 13 out of 42 possible BERDE points classifies it as below standard for green building compliance.

The results highlight several critical gaps in sustainability practice. The absence of renewable energy systems, efficient water reuse mechanisms, and proper solid waste management underscores the need for comprehensive retrofitting and policy enforcement. Although passive design features such as natural ventilation and daylighting reduce energy consumption, these alone are insufficient to meet current sustainability benchmarks. In addition, stakeholder feedback emphasized cleanliness, waste segregation, and spatial organization as urgent priorities—concerns that reflect the intertwined social and environmental dimensions of sustainability.

The assessment confirms the relevance of BERDE as a contextual framework for evaluating public infrastructure in the Philippines, but it also reveals that its adoption remains limited in provincial settings due to technical, financial, and administrative constraints. Strengthening the capacity of local governments to integrate BERDE principles into the planning, construction, and maintenance of public facilities is therefore essential. Enhancing awareness, training local technical personnel, and incentivizing green procurement can bridge the gap between national sustainability goals and local implementation.

Ultimately, this study concludes that sustainability in public markets is both achievable and necessary. Improving the San Jose de Buenavista Public Market's environmental performance will not only reduce its ecological footprint but also enhance public health, community identity, and economic resilience. By adopting systematic waste management, renewable energy systems, efficient water use technologies, and biophilic design strategies, local governments can transform markets into exemplars of sustainable and inclusive architecture—spaces that uphold both environmental stewardship and social equity in line with the United Nations Sustainable Development Goals.

Recommendations:

Based on the findings of the preliminary sustainability assessment, several actions are recommended to improve the environmental performance and operational efficiency of the San Jose de Buenavista Public Market and to guide future infrastructure projects seeking BERDE compliance. These recommendations are organized in relation to the six core categories of the BERDE Green Building Rating System and the broader goals of the Philippine Green Building Code and the United Nations Sustainable Development Goals (SDGs).

The LGU should integrate ecological site planning into future redevelopment of the market. This includes providing landscaped areas, permeable pavements, and vegetative buffers that can reduce surface runoff and heat gain. Urban greenery not only enhances aesthetics but also improves microclimate and biodiversity within the market precinct. The addition of small community gardens or vertical greening systems could strengthen the relationship between built and natural environments, aligning with the principles of ecological responsive design (Grobman et al., 2023). To address deficiencies in the Energy category, the LGU is encouraged to invest in renewable energy technologies, such as rooftop solar photovoltaic systems for lighting and ventilation. Retrofitting existing lighting with high-efficiency LED fixtures and adopting motion-sensor or daylight-controlled systems can further reduce electricity consumption. The market should also establish an energy management plan that monitors usage, identifies high-consumption areas, and enforces conservation practices among tenants. Collaborating with the Antique Electric Cooperative and the Department of Energy for technical support could make this transition both feasible and cost-effective.

Improving water sustainability requires a combination of conservation, reuse, and management. The current rainwater harvesting practice can be expanded by incorporating larger catchment systems connected to filtration units for cleaning and sanitation. Installing low-flow faucets, dual-flush toilets, and leak detection systems would reduce potable water demand. The adoption of graywater recycling—treating wastewater for non-potable reuse—can significantly enhance water efficiency, supporting both BERDE's Water category and SDG 6 (Clean Water and Sanitation).

Given that waste management emerged as the weakest category, the LGU should prioritize establishing a comprehensive solid waste management system. This includes the strict implementation of waste segregation at source, provision of color-coded bins, and daily waste collection in coordination with the Municipal Environment and Natural Resources Office (MENRO). Market tenants should undergo orientation on segregation, recycling, and composting practices. Additionally, the LGU may consider developing an on-site organic composting area for biodegradable waste generated by fish, meat, and produce vendors. Such initiatives will not only improve sanitation and reduce odor but also transform waste into valuable compost for local green spaces.

To improve performance in the Materials category, the LGU should adopt a green procurement policy prioritizing eco-labeled, recycled, and locally produced materials for renovation and maintenance. The use of bamboo, hollow blocks with fly ash, low-VOC paints, and recycled metal components can reduce embodied carbon. Furthermore, integrating life-cycle assessment (LCA) in material selection will ensure that decisions consider long-term environmental impact, durability, and economic viability. These measures also support community-based enterprises, reinforcing local livelihoods while promoting sustainability.

To minimize air and refrigerant emissions, it is recommended that the market transition to low-global-warming-potential (GWP) refrigerants and phase out the use of freon-based systems in cold storage areas. Ventilation should be enhanced by installing ceiling exhaust fans or hybrid natural-mechanical ventilation systems to improve indoor air quality. The LGU should also conduct a greenhouse gas (GHG) inventory to track the market's carbon emissions, establishing a baseline for future mitigation measures. Regular air-quality assessments can help identify pollution sources and ensure a healthier market environment for tenants and consumers.

Institutional sustainability requires not only technical interventions but also governance reform. The LGU of San Jose de Buenavista should establish a Sustainability and Green Infrastructure Committee to oversee implementation, monitoring, and periodic evaluation of BERDE-aligned projects. Continuous training of municipal engineers, architects, and market administrators on green building standards will ensure that sustainability principles are internalized and sustained. Engaging academic institutions such as La Consolacion College Bacolod and the Philippine Green Building Council in capacity-building and technical assistance programs.

Lastly, sustainability must be understood as a collective responsibility. Regular public awareness campaigns and environmental education programs should be conducted for market vendors, consumers, and local residents. Encouraging community participation through eco-fairs, clean-up drives, and green market initiatives will help embed environmental stewardship into everyday practice. When people experience tangible improvements in cleanliness, orderliness, and comfort, they become active partners in maintaining the sustainability of the public market.

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