



Redesign of Baturiti Vegetable Market in Tabanan Regency with the Application of Sustainable Building Concept

Made Eka Wijaya¹, Freddy Hendrawan², I Kadek Pranajaya³, Ngakan Ketut Acwin Dwijendra^{4*}

^{1,2,3}IDB Bali, Denpasar, Bali

⁴Universitas Udayana, Bali

Corresponding Author: Ngakan Ketut Dwijendra : acwin@unud.ac.id

ARTICLE INFO

Keywords: Market Redesign, Traditional Infrastructure, Sustainable Design, Tri Hita Karana

Received : 12, July

Revised : 25, August

Accepted: 20, September

©2025 Wijaya, Hendrawan, Pranajaya, Dwijendra : This is an open access article distributed under the terms of

the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/)



ABSTRACT

The Baturiti Vegetable Market in Tabanan Regency, Bali, plays a strategic role as a center for the distribution of agricultural products and local economic activities. However, the market faces various problems, such as inadequate physical conditions, inefficient layouts, chaotic circulation, substandard sanitation facilities, and lack of aesthetic appeal. The design uses the *Glass Box* design method, which emphasizes the transparency of the design process. The theories used include sustainable design, energy efficiency, and Tri Hita Karana-based spatial planning concepts that emphasize harmony between humans, the environment, and spirituality. The results of the study show that the proposed market design includes efficient zoning, better circulation of visitors and traders, as well as optimization of ventilation and natural lighting. In addition, the design concept involves green areas and supporting facilities, such as rest areas and local food zones, to enhance the tourist attraction of the market. This redesign is expected not only to be a solution to existing problems but also to contribute to the economic, social, and environmental sustainability of the Baturiti community.

INTRODUCTION

The market is one of the vital elements in the economic system of the community. By *Great Dictionary of Indonesian Language* (KBBI, 2008), a market is defined as a place where sellers and buyers meet to carry out buying and selling transactions, as well as a place held by an organization or association for certain purposes, including fundraising. In this context, the market plays a role not only as a trading center, but also as a space for social interaction.

Traditional markets have unique characteristics and are different from modern markets. According to *the Regulation of the Minister of Trade of the Republic of Indonesia Number 21 of 2021*, traditional markets are places to sell basic necessities produced by small, medium, and micro-scale economic actors, such as farmers, fishermen, craftsmen, and household industry players. Thus, traditional markets are not only a center for the distribution of goods but also an important forum for the people's economy.

In Bali, the existence of traditional markets is one of the main supporters of the tourism sector. In addition to functioning as an economic center, traditional markets also have high cultural value, reflecting the traditions and local wisdom of the Balinese people. These markets are often a tourist attraction due to their authenticity and the uniqueness they offer, such as the atmosphere of traditional trade and distinctive local goods (Koster, 2022).

However, traditional markets in Indonesia, including Bali, often face various challenges. One of the main challenges is the poor image due to the physical condition of the market that is poorly maintained, unhygienic, and chaotic. This makes it difficult for traditional markets to compete with modern markets that offer better comfort and facilities (Prabandari, 2024).

In an effort to increase the competitiveness of traditional markets, the Indonesian government has launched a traditional market revitalization program. This revitalization includes various aspects, such as improved management, trade management, and zoning, as well as physical renovation of buildings and their supporting facilities. This program aims to create a cleaner, healthier, and more organized market environment, so that it can attract more buyers and strengthen its existence as a people's economic base (Prabandari, 2024).

The Baturiti Vegetable Market in Tabanan Regency is one example of a traditional market that has an important role in Bali. As the main supplier of vegetables for local needs and tourism, this market supports the economic sustainability of various sectors. However, the current market conditions are still far from the expected standard. Based on field observations, Baturiti Vegetable Market faces various problems, including poor building conditions, irregular arrangement, and minimal supporting facilities.

Some of the main problems found include lack of clean water facilities, inadequate sanitation such as toilets, minimal garbage cans, poor drainage systems, and chaotic parking areas. This condition not only reduces the comfort of traders and buyers, but also negatively impacts the overall image of the market. If left unchecked, this market risks losing its function as a vital local economic center (Koster, 2022; Sanjaya, 2022).

The Bali Provincial Government, through Governor I Wayan Koster, has launched a plan to grant these market assets to traditional villages. This initiative aims to empower indigenous villages in market management, thereby creating a more effective and sustainable system. The support from the Regent of Tabanan, I Komang Gede Sanjaya, shows the government's commitment to improving the welfare of the village community and strengthening the local original income (PAD) of Tabanan Regency (Sanjaya, 2022).

The rearrangement of the Baturiti Vegetable Market is a strategic step needed to overcome these various problems. This approach includes not only the physical improvement of buildings but also the implementation of sustainable design concepts that can have a positive impact on the environment and society. The concept of sustainable building includes better waste management, energy efficiency, the use of environmentally friendly materials, and the optimization of spaces for social interaction (Prabandari, 2024).

Additionally, it is important to consider the cultural aspect in the redesign of this market. Traditional Balinese architecture, with its underlying philosophy, can be integrated into the design of the market to maintain a local identity. This approach will not only increase market appeal but also provide an authentic cultural experience for buyers and tourists (Koster, 2022).

The urgency of this design lies in the urgent need to improve unsuitable market conditions, support the discourse of market grants to customary villages, and increase the competitiveness of traditional markets in the midst of competition with modern markets. In addition, this design is relevant to cultural and environmental preservation efforts, which are important challenges in the current era of globalization (Sanjaya, 2022).

LITERATURE REVIEW

Here is a review of some of the relevant market redesign projects:

1. Redesign of Bersehati Traditional Market in Manado: Simplicity in Architecture (Genah, 2013)
2. Bersehati Traditional Market faces common problems in traditional markets, such as irregular regulation of trade areas, poor circulation patterns, and lack of supporting facilities, such as parking areas and garbage cans. The redesign of this market uses the *concept of "Simplicity in Architecture"*, which emphasizes simplicity in architecture, yet remains aesthetic and functional. The main goal of this redesign is to create a more attractive, clean, comfortable, and modern market, with complete facilities like a modern market.
3. Application of the Concept of Bamboo Tectonics in Pasar Harapan Jaya Bekasi (Satwikasari, 2018)
4. The redesign of Pasar Harapan Jaya focuses on the use of bamboo as the main material in the building structure. The *concept of bamboo tectonics* highlights the art of connecting bamboo structures that are efficient, aesthetically pleasing and environmentally friendly. The project also supports sustainable architectural principles, such as energy efficiency, waste management, and the use of renewable materials.

5. Application of Behavioral Architecture Design in the Redesign of the Surakarta Panggungrejo Market (Saputro, 2018). The Panggungrejo Market has experienced a decrease in economic activity due to the design of the building that is not in accordance with user behavior. This market redesign uses the concept of *behavioral architecture*, which focuses on space flexibility, ease of access to circulation, and market appearance that reflects local identity.

The conclusion of the literature review of the Redesign of the Baturiti Vegetable Market seeks to improve the shortcomings of previous research with a more holistic approach, including sustainability, function, aesthetics, and preservation of local culture. This research is expected not only to improve the quality of the market functionally, but also to contribute to the development of traditional markets that are relevant to the modern era. This structure ensures that all relevant data has been integrated, with an emphasis on the strengths of current research and the shortcomings of previous research.

Redesign comes from the word "redesign", which consists of two words "re" and "design". In English, the word re refers to repetition, so redesign can be understood as a repetition of the design. (Widnyana, 2019). According to Helmi (2008), the definition of redesign is a work that is designed and replanned so as to achieve a certain goal. According to John.M, the definition of redesign is an activity of designing and replanning a building with the aim of physical changes without changing its function, either from expansion, change, or even location relocation. According to the Ministry of Education and Culture (1996), the word redesign is taken from English, namely Redesign which means to redesign. Another meaning is that something that is no longer functioning can be rearranged as it should be. According to the American Heritage Dictionary (2006), redesign means making a revision in appearance or function. According to the Collins English Dictionary (2009), redesign is defined as changing the design of something.

Based on the theories that have been explained above, it is concluded that the redesign activity in this design, namely, designing and replanning building objects based on their needs and functions.

METHODOLOGY

In the design process of the Baturiti Vegetable Market Redesign, the Glass Box Method is used, which is a transparent method that allows each stage of the design to be evaluated systematically. This method provides guidance for producing designs that meet the standards of feasibility, efficiency, convenience, and sustainability principles.

Environmental Design Approach

The Environmental Design *method* is used as the main approach, combining the principles of ecology, environmental psychology, social, aesthetics, adaptation, and holistic. This approach creates a design that is responsive to the needs of users and long-term environmental impacts.

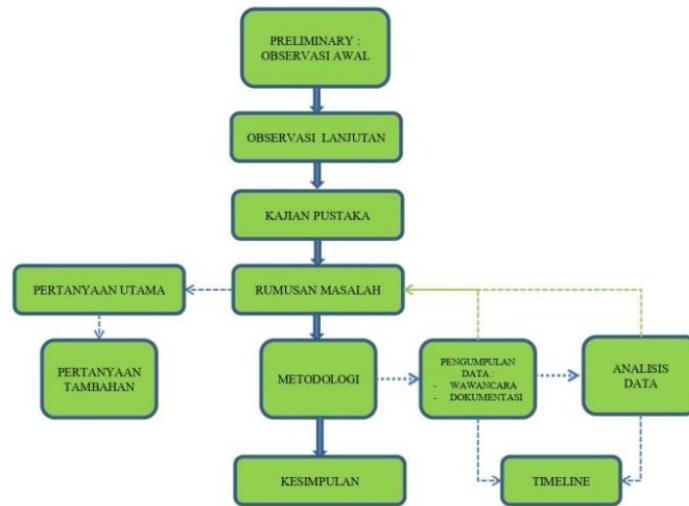


Figure 1. Flowchart Research Method

Source: Personal data, 2024

Planning Flow Diagram:

1. Initial Observation: Identifying problems in the Baturiti Vegetable Market.
2. Literature Review: Reviewing relevant literature as a theoretical foundation.
3. Problem Formulation: Develop the core questions that are the focus of the research.
4. Data Collection Methodology: The techniques used include interviews, observations, and literature studies.
5. Data Analysis: Analyze the results of data collection to identify design solutions.
6. Formulation of Redesign Proposals: Designing design recommendations based on analysis.
7. Conclusion: Compiled a final design and design report.

RESULT AND DISCUSSION

Site Analysis Results

The Baturiti Vegetable Market is administratively located in Baturiti District, Tabanan Regency, Bali Province, precisely on the Denpasar-Singaraja Highway, Baturiti. The location of this market is on the main road connecting Denpasar and Singaraja, making it strategic for trading activities. This location is very strategic because it is located on the crossroads of tourism and agriculture, making it easy for traders and buyers from various regions in Bali.



Figure 2. Location map of Baturiti Vegetable Market

Source: <https://earth.google.com/web>

This site has a land area of 8169.90 m² which is very strategically located because it is on the route of tourism and agriculture, facilitating access for traders and buyers from various regions in Bali. The following are the boundaries of the Baturiti market area:

- 1) North: Kintamani Dog Breeding Park.
- 2) South: Jalan Taman Sari and Balai Banjar Baturiti Kaja.
- 3) East: Denpasar-Singaraja main line (national road).
- 4) West: The river and the Banjar Baturiti Kaja Hall.

This location is very strategic because it is located on the crossroads of tourism and agriculture, making it easy for traders and buyers from various regions in Bali.

Footprint Shape

The land to be used in this design has an irregular shape, with a total area of 8169.90 m². The maximum footprint KDB reaches 4901.94 m² with the following boundaries:

- 1) North : 3.6 meter side boundary
- 2) South : 3.6 meter side boundary
- 3) East : 7 meter front boundary
- 4) West : 5 meter river boundary

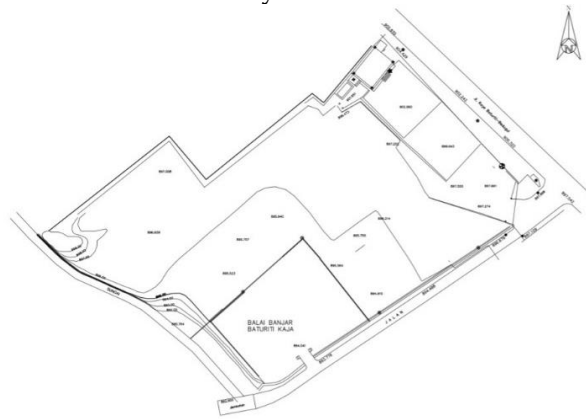


Figure 3. Map of the Baturiti Vegetable Market site Source: personal data, 2004

The shape of the tread is irregular and has a slight slope towards the river which supports natural drainage.

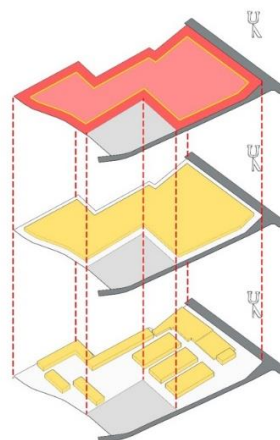


Figure 4. Analysis of the Shape of the Building Period

Source: Personal Analysis, 2025

The site area has regulations regarding setback of 7 meters from the main road, 3.6 meters from the secondary road, 3.6 meters from the boundary of the adjacent land and 5 meters from the river.

The basic form on the building follows an irregular site shape by following the maximum building KDB area of 4,901.94 square meters. Massing the shape of the building is made separately to facilitate the circulation flow of related activities.

Results of Space Standard Analysis

Based on the standard of the market space as well as considerations for the convenience of traders and buyers, the size of the stall will be 4 x 6 meters/24 square meters. For supporting facilities such as toilets, garbage cans are adjusted to the availability of land without reducing the minimum size standards that are comfortable and efficient.

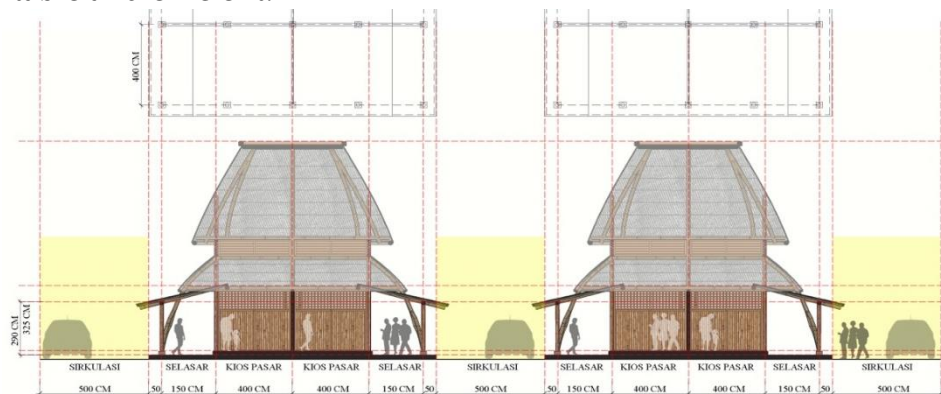


Figure 5. Pieces of Kiosks and neighborhood streets in the Market

Source: Personal Analysis, 2025

The circulation line between stalls is 1.5 meters and the width of the neighborhood road inside the market is 5 meters, as well as the zoning of the room is grouped according to the type of merchandise to make it easier for visitors to shop.

Theme Approach Results

The Baturiti Vegetable Market is designed with the theme of Tropical Architecture. Tropical architecture is a style of architecture designed specifically for tropical climatic environments, which has characteristics such as the use of natural ventilation, high ceilings, and tropical weather-resistant materials. This concept aims to create a comfortable, cool, and energy-efficient building, by utilizing natural conditions such as sunlight and wind.



Figure 6. Redesign of the Baturiti Vegetable Market Masterplan

Source: Personal Analysis, 2025



Figure 7. Appearance of Baturiti Vegetable Market
 Source: Personal Analysis, 2025



Figure 8. Atmosphere inside the Culinary and Kiosk Area
 Source: Personal Analysis, 2025



Figure 9. The atmosphere of the Culinary Area overlooking the River View
 Source: Personal Analysis, 2025

Concept of Form

It uses a functional and flexible square geometric shape, which symbolizes simplicity, regularity and stability. The shape of the box gives the impression of being easily accessible, open and inclusive for all walks of life. The shape of the box is also a representation of an efficient and easy-to-develop modular system.



Figure 10. Transform the form from the existing (before) analysis
 Source: Personal Analysis, 2025



Figure 11. Transform form from existing analysis (after)
 Source: Personal Analysis, 2025



Figure 12. Shape transformation with modules
 Source: Personal Analysis, 2025



Figure 13. The result of the transformation of the building form
Source: Personal Analysis, 2025

Facade Concept

Inspired by the Banjar Baturiti Kaja Hall, Baturiti Village, Baturiti District, Tabanan Regency, which is located next to the market, became the inspiration for the concept of the façade of the market building. The shape of the market design is inspired by bale banjar, creating the impression of an open space with a spacious column structure without many walls. The main building of the market can be made to resemble a bale with bamboo columns that support a wide roof. This design not only makes it easier for people to move around, but also allows natural lighting to enter evenly.

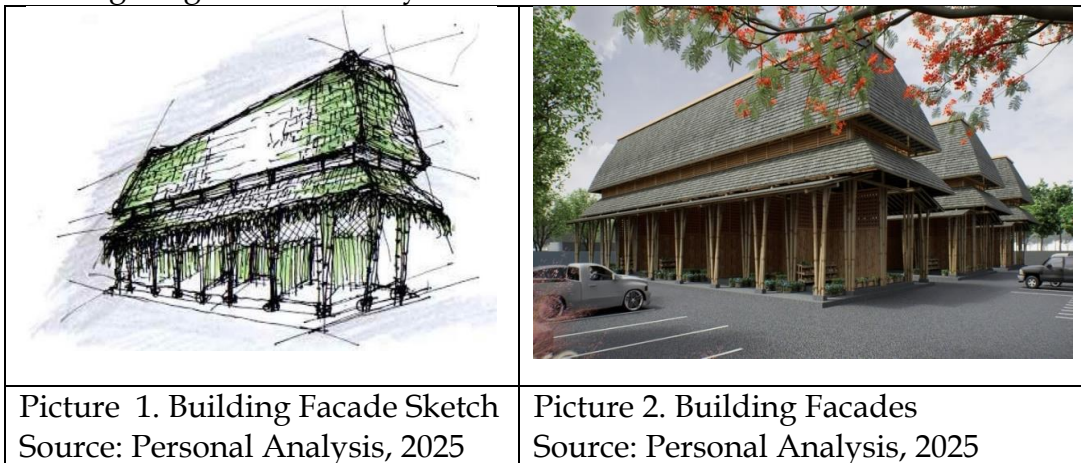


Figure 16. Building Facade Atmosphere
Source: AI Analytics, 2025

Material Concept

In the material concept, this market uses durable materials. Easy to clean and eco-friendly and choose local materials that are easy to find also support sustainable design and reduce carbon footprint. The selection of materials includes using roofs, structures/posts and walls are dominated by bamboo, with polished cement floors and anti-slip ceramics.



Figure 17. Material Concept
Source: Personal Analysis, 2025
Concept of Structure

In the concept of the structure of the market, a river stone foundation structure system is used to support bamboo poles that continue upwards to the roof, but in some spaces such as public toilets and managers use standard building structures in general, namely bricks with concrete columns for safety and comfort in activities. And for the upper building structure, using an environmentally friendly bamboo structure without compromising the safety and comfort of users and adding value to the aesthetics of the building. In the structure system, this Market uses a modular system with a span of 4 x 6 meters. Where the construction is carried out horizontally on 1 floor to support market activities.

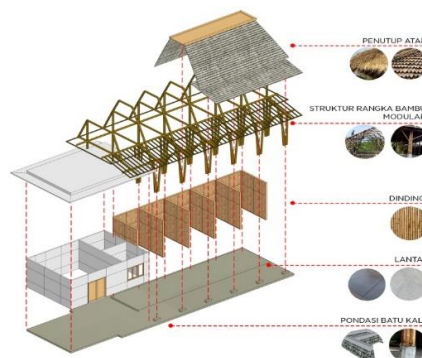


Figure 18. Concept of Structure
Source: Personal Analysis, 2025

Konsep Entrance

Because the position of the land is on the hook / at the angle of the entrance is placed at a west-south angle facing North-East. The entrance position adopts the old entrance position to make it easier to be recognized and in achievement

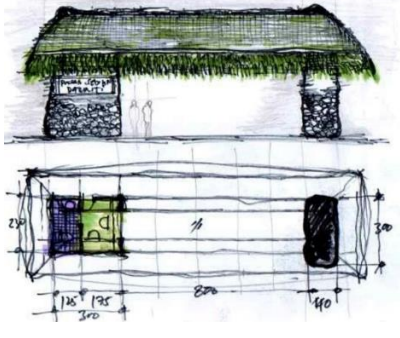

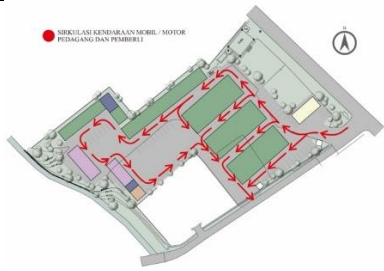
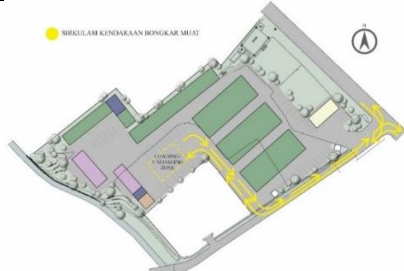
	
<p>Figure 19. Gate Entrance Concept Sketch Source: Personal Analysis, 2025</p>	<p>Figure 20. Gate Entrance Concept Source: Personal Analysis, 2025</p>



Figure 21. Side Entrance Concept
Source: Personal Analysis, 2025

Circulation Concept

In this Market building, the circulation flow is designed very openly but still with a clear flow so that it is easily accessible to sellers, buyers, visitors and Market managers. Likewise, circulation access for the fire brigade in an emergency becomes easy to enter the site without being obstructed.

	
<p>Figure 22. Circulation of cars/motorcycles of traders and buyers Source: Personal Analysis, 2025</p>	<p>Figure 23. Circulation of loading and unloading vehicles Source: Personal Analysis, 2025</p>

Landscape

The concept of Market Landscape aims to determine the planning of outdoor spaces that can provide comfort, aesthetics and circulation from the entire community in the market without reducing its main functions.

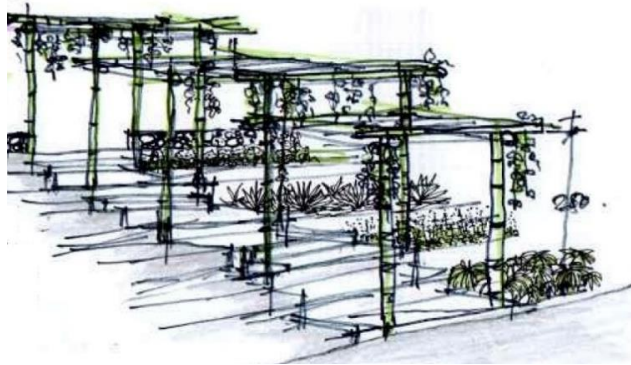


Figure 22. Landscape Concept Sketch
Source: Personal Analysis, 2025



Figure 24. Landscape Vegetation Concept
Source: Personal Analysis, 2025



Figure 25. Landscape Pavement Concept
Source: Personal Analysis, 2025

This concept explains the types of elements used in landscaping as follows:

1. Vegetation (softscape). Plant vegetation in outdoor spaces serves as a shade element and adds aesthetic value to the site. The planting of fruit trees such as mango, coconut, guava, guava and perindang plants such as tabebuaya, ketapang kencana, is more functional as protection from excessive sunlight and wind than market building users in addition to its aesthetic function. Medicinal plants such as cat whiskers, sambiloto, aloe vera, betel leaves, kencur, turmeric and so on are used to present tropical nuances and add to the aesthetic value of the market. The combination of these plants will create a beautiful atmosphere, provide thermal comfort, strengthen the character of the market building and preserve and sustainability the environment.
2. Hardscape. The type of pavement in the outer space of the market building used such as split stones, river stones and asphalt functions as a support for the comfort, convenience and safety of the circulation of this market community and also provides additional aesthetic value to the market building.

Utility Concept

1. Water Management. Because in the rainy season, rainfall is quite high in the market area, the concept of water management in this market uses an overflow rainwater collection system that is channeled from the roof gutter then directed with pipes, then accommodated with a water tank which in the future can be used to water plants and as toilet water.
2. Waste management. The processing concept in this market uses the concept of integrated waste management, namely the division of garbage cans according to the type of waste, both organic and inorganic, which is then collected first in a special area within the site before being processed out.

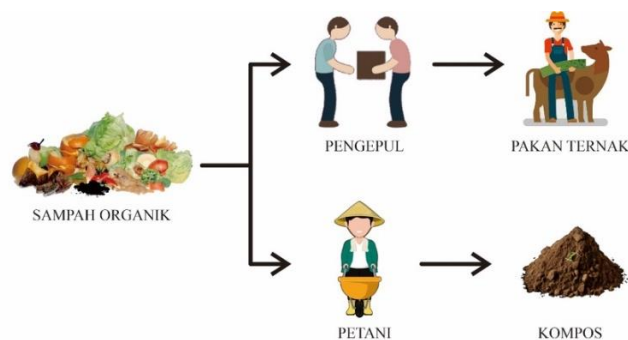


Figure 26. Organic waste treatment diagram

Source: Personal Analysis, 2025

Considering that this market focuses on vegetable food products, the remains of the vegetable products are collected first in the stall area of each trader in the market, then distributed to collectors for animal feed and to farmers to be used as compost.

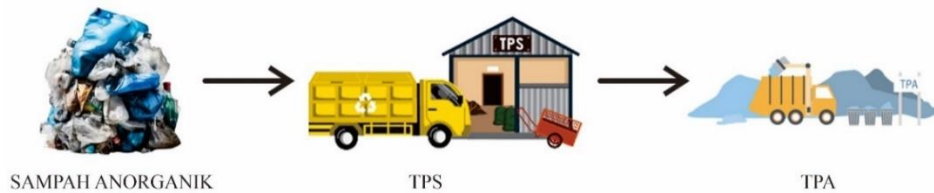


Figure 27. Inorganic waste treatment diagram

Source: Personal Analysis, 2025

In organic waste, the rest of the activities in the market are made a special area for the Temporary Disposal Site (TPS), especially for inorganic waste, after being collected in the TPS then transported to the nearest Final Disposal Site (TPA), so that it can be processed better.

1. Wastewater Disposal System: Domestic waste (*grey water and black water*) from bathrooms and kitchens, must be drained into the treatment system before disposal. Septictanks and infiltration wells are used if they are not connected to the city's WWTP (Wastewater Treatment Plant) network. The septic tank must be designed with sufficient capacity to hold wastewater.

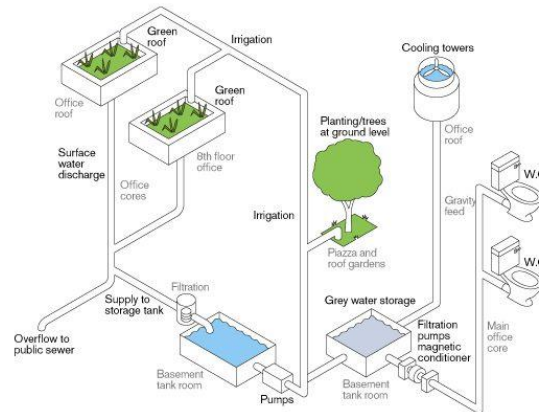


Figure 28. Utility concept drawings

Source: <https://in.pinterest.com/pin/19773685838217686>

2. Drainage System and Inundation Prevention. Drainage channels are essential by ensuring that there is surface drainage to drain rainwater into the city's drains. Infiltration wells or biopores are added to increase groundwater infiltration and reduce rainwater overflow. The remnants of the excess rainwater overflow are drained through drainage channels within the site leading to the city's drainage line and the river to the west of the site which is

lower than the site, so that during heavy rainfall, the excess rainwater can flow efficiently and prevent flooding at the site.

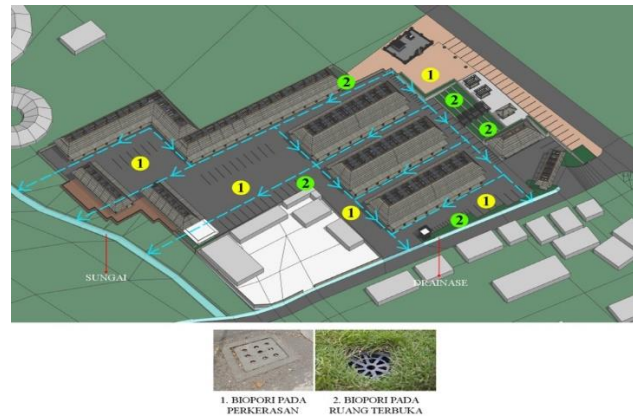


Figure 29. Drainage system and inundation prevention
Source: Personal Analysis, 2025

CONCLUSION AND RECOMMENDATION

This design began through observation activities of the condition of the Baturiti Vegetable Market which is still far from the expected standard, while the conditions around the market have quite good natural resources. Based on the results of field observations, the Baturiti Vegetable Market faces various problems, including poor building conditions, irregular arrangement, and minimal supporting facilities.

From this, it was found that several main problems include lack of clean water facilities, inadequate sanitation such as toilets, minimal garbage cans, poor drainage systems, and chaotic parking areas, so that a design that is able to solve these market problems is needed. From this design, it turns out that the Baturiti Vegetable Market must be designed sustainably.

This design provides an overview of the importance of market design that takes into account economic, social and ecological turnaround, which can provide a better model of market design in the future. The redesign of the Baturiti Vegetable Market with the application of the concept of sustainable building is a response to the need for a functional, environmentally friendly and contextual public space with the local potential of Baturiti village, Tabanan Regency. Based on the results of the design and design approach carried out, the following can be concluded:

1. The application of sustainable building principles in market design includes energy efficiency through natural lighting and cross ventilation, the use of local and environmentally friendly materials, and rainwater storage and utilization systems. This step has a positive impact on reducing carbon footprint and long-term operational costs.
2. The integration of local wisdom such as the shape of the roof, circulation patterns, and the use of bamboo materials as visual elements, can improve the identity of local character and market cultural identity, while strengthening the relationship between the community and the built environment.

3. Flexible market zoning supports the smooth running of market activities both in terms of visitor circulation, distribution of goods and interaction between traders, this provides comfort and efficiency in daily operations.
4. Strengthening the ecological function of the market area through the addition of green open spaces, productive parks with fruit and medicinal plants, as well as local weeds. This not only provides environmental value, but also educational and social functions.
5. The design that is responsive to the tropical climate is realized by the shape of the building that is adaptive to heat and rain, natural air circulation and the use of natural shade, creating a cool, comfortable and healthy market.

ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to the Master of Design Program, IDB Bali, for providing academic support and facilities during the research process. Special thanks are extended to the Tabanan Regency Government and the Baturiti Village community, who gave valuable insights, data, and access to the field, making this research possible.

We are also indebted to our colleagues and reviewers who provided constructive feedback that helped refine the ideas and strengthen the academic quality of this article. Finally, the authors would like to acknowledge the continuous encouragement and inspiration from our families, whose unwavering support motivated us throughout the completion of this work.

REFERENCES

- Akbar, F., Mauliani, L., & Satwikasari, A. F. (2019). The application of the concept of bamboo tectonics as a sustainable material in Pasar Harapan Jaya Bekasi. *PROTOTYPE Architecture Journal*, 3(4), 9–16.
- Ching, F. D. K. (2014). *Architecture: Form, space, and order* (3rd ed.). John Wiley & Sons.
- Dwijendra, N. K. A. (2020). The transformation of traditional Balinese house architecture in tourism villages. *International Journal of Advanced Science and Technology*, 29(8), 6802–6812.
- Edwards, B. (2005). *Rough guide to sustainability: A design primer*. RIBA Enterprises.
- Genah, T. F. (2013). Redesign of Bersehati traditional market in Manado: Simplicity in architecture (Undergraduate thesis, Sam Ratulangi University).
- Knapp, R. G. (2015). *Asia's vernacular architecture: Traditions, transformations and futures*. Routledge.
- Koster, W. (2022, May 9). Baturiti vegetable market donated to traditional village. *NusaBali*. <https://www.nusabali.com/berita/117086/pasar-sayur-baturiti-dihibahkan-ke-desa-adat>
- Market. (n.d.). *Great dictionary of Indonesian language (KBBI)*. <https://kbbi.web.id/pasar> (Accessed November 10, 2024)
- Mayoni, K., Widhiyaningsih, I. H., Dharnendri, L. Y. I., Semaranatha, K., & Wiryasanjaya, M. T. (n.d.). Implementation of the teachings of Tri Hita Karana in the development of Balinese society. *Repository of Multidisciplinary Journals*, 1(5), 90–95.
- Ministry of Trade. (2021). *Regulation of the Minister of Trade of the Republic of Indonesia Number 21 of 2021 concerning traditional markets*. Ministry of Trade.
- Oliver, P. (2006). *Built to meet needs: Cultural issues in vernacular architecture*. Routledge.
- Prabandari, N. (2024, March 29). The proliferation of traditional market development with modern facilities in Bali, is it effective? *Jawa Pos*. <https://www.jawapos.com/opini/014495080/menjamurnya-pembangunan-pasar-tradisional-dengan-fasilitas-modern-di-bali-efektifkah>
- Rapoport, A. (2005). *Culture, architecture, and design*. Locke Science Publishing.

Salura, P., & Clarissa, S. (2020). Sustainable architecture: Between the concept and application in Indonesia. *IOP Conference Series: Earth and Environmental Science*, 532(1), 012013. <https://doi.org/10.1088/1755-1315/532/1/012013>

Saputro, B. W. (2018). The application of behavioral architecture design in the redesign of the Panggungrejo Market Surakarta. *Shentong: Scientific Journal of Architecture Students*, 1(2), 203–212.

Vale, B., & Vale, R. (1991). *Green architecture: Design for a sustainable future*. Thames and Hudson.

Widnyana. (2019). Redesign of Banyuasri Singaraja traditional market.