



Revitalization of Sports Hall Tumenggung Abdul Jamal Batam with Sustainable Building Approach

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ABSTRACT

Sports organizations are receiving more and more requests to lessen the detrimental effects of venues and activities held on the environment as the green environment movement continues to spread quickly throughout the world. With the widespread appeal of professional sports across cultural divides, leading Teams' embrace of pro-environment activities also has the ability to spur good social change among fans and spectators. One of the best ways to revitalize a historic area is to give the buildings a new use in addition to their previous one. Redevelopment of a location that can enhance the area's functionality is referred to as revitalization. The goal is to raise the value of the land or location. The revitalization of Sports Hall Tumenggung Abdul Jamal aims to revive the image of Sports Hall with a Sustainable Architecture approach where buildings or assets will be maintained as the identity of the city and provide life activities that benefit the community so that economic value is obtained that ensures the building is maintained and the benefits of use can be felt by the wider community.

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1. INTRODUCTION

Play as a meaningful activity that is carried out for its own purpose, removed from the demands of daily life both physically and temporarily, and constrained by an unbending set of self-policing rules (Huizinga, 2014). Play can also be defined as a physical activity that is carried out willingly and earnestly through activities accompanied by feelings of tension joy, and awareness. Humans come to a world built to play. That is, play at least part of our destiny, this is not a speculative expectation of how we want something or provisions from God's point of view. Rather it is a crude description of human behavior. Play behavior is a very pleasant behavior. Play behavior is not limited by age, children to adults are very fond of playing. Playing is also not only done by humans, animals also like to play.

However, we often compare playing with children. They're not the only ones who need to play, but they exemplify the passion needed to play in one's life. Playing is like booze that makes a person drunk and forget or lose his mind. Drunk children playing they will forget the time, forget to eat, and so on. They enjoy spending their time playing and playing. But play requires high intelligence because intelligence allows living things to make important differences anywhere. Play is a basic thing in games and sports. The game has slightly more complete rules than playing, winning and losing, the rules are not standard, and there are rules agreed upon by its players, the game aspires to the situation, is determined by freely accepted rules, is truly binding, and is understood in such a way as to make the achievement of goals efficient.

Where as sport allows us to discover the benefits of repeating any form of play that uses the physical. Ideally, sport in the purest sense, allows us to experience all the good qualities we usually associate with playing. Play is also very important in the formation of athletes in the sport of achievement. Where by playing this can be a process of socialization, that is, humans learn and accept the values, attitudes and skills of people around them to form their own personality. Can help an individual play his or her social functions and roles perfectly and effectively. With more freedom a person interacts, works in a group or exercises self-control. With the social process that an individual goes through can become a member of a group by studying the culture of that group and its role in that group.

Batam City which is a city with good development, and needs to be balanced with adequate facilities, the Sports Hall located in the Tumenggung Abdul Jamal Area is in the center of Batam City. Sports Hall Tumenggung Abdul Jamal which is managed by BP (Batam Free Trade Area and Free Port Entrepreneurs Agency) Batam, which is located in a complex consisting of a stadium, badminton gor, and sports hall is currently experiencing a decline in quality due to the age of the building itself as well as physical and non-physical problems. The increasing needs of the city community will be a good place for facilities, making Temenggung Abdul Jamal Sports Hall must be revitalized, so that it can be used optimally and can meet the needs of the people of Batam City for its facilities and infrastructure. By looking at the shortcomings and problems that exist now, which will later be thought of for the addition of facilities needed at this time. So that later the needs of the community can be accommodated. With the theme of the Sustainable Building approach, it is hoped that this building will remain an icon in Batam City by not eliminating the identity that has existed before (Hendrawan, 2015).

2. THE MATERIALS AND METHOD

2.1 The Materials

A. Sports Hall

Sports hall comes from English, namely sport, from Latin *disportase* or *departase*, in Italian it becomes *diparte* which means fun, maintenance, or entertaining to have fun, namely exercise (Hermawan et al., 2022). While the hall is a hall or closed room. So what is meant by a sports hall is a place for carrying out certain sports activities in a closed room.

B. Sports Hall functions

Sports hall has several functions, namely as a means of coaching and improving sports achievements and increasing sports appreciation for the community, as a recreation where involved in sports activities directly or indirectly with the aim of recreation, and has a social function as a means of communication about the world of sports both between athletes and athletes and athletes with the community (Mutuari and Gesyari, 2020).

C. Sustainable Building

Sustainable design aims to reduce the negative effects of the building environment through the efficient and moderate use of resources, energy, and the creation of spaces and ecosystems in general (Neyestani, 2017). Sustainable architecture, also known as the theory, science, and style of buildings designed and constructed in accordance with ecologically friendly principles, employs a conscientious approach to energy and ecological conservation in the design of the built environment. (Iii, 2014).

D. Revitalization

Revitalization is an effort to revitalize an area or part of a city that once lived, but then experienced setbacks. Revitalization can also be said to be a way of changing a place so that it can be used for more suitable use (Suwanto et al., 2022). The problem of structuring the urban environment through revitalization is not just a physical (architectural) problem or how to restore the vitality of the city.

However, it is related to the discourse of forming an area that is responsive or responsive to social dynamics, by heeding ecological aspects, in order to provide a distinctive meaning or identity through its environmental footprint (Widiastuti et al., 2015). More comprehensively, when linked to a sustainable paradigm, revitalization is an effort to recycle urban assets with the aim of providing new vitality, increasing existing vitality, or even reviving existing vitality. However, it is certain that the goal is to create a new productive life and be able to make a positive contribution to socio-cultural life and especially the economic life (region) of the city (Martokusumo, 2008).

E. Literature Review

Previous research related to the design of a sports hall that will support the realization of the Sports Hall with the application of Sustainable Building has been carried out by several researchers. However, for the application of sustainable building in a sports hall building, precisely in Batam City, there are still not many people doing it, therefore researchers are first looking for related to sports halls with the application of the concept of sustainable building, including as stated in table 1.

Table 1. Previous Research related to Sports Hall with the application of the Sustainable Building concept, 2022

Author (Year)	Title	Method	Parameters
Joan, Egi, Ahmad, Syafriadi, (2022)	Revitalisasi Bangunan Balai Pertemuan Menjadi Gedung Bulutangkis Dikabupaten Kapuas Hulu	Quantitative, Qualitative	Sports Hall, Revitalization
Retdia, Ari, Anisa, (2014)	Strategi Penerapan Konsep Adaptive Re-use Pada Bangunan Tua Studi Kasus: Gedung PT P.P.I (EX.Kantor PT TJIPTA NIAGA) Dikawasan Kota Tua Jakarta	Comparative, Qualitative	Revitalization
Mega, Dwi, Dody, (2021)	Revitalisasi Benteng Vastenburg Dengan Pendekatan Arsitektur Monumental di Surakarta	Interview, Observation Documentation	Revitalization, Monumental
Reinaldo, (2012)	Revitalisasi Taman Satwa Taru Jurug Dan Wisata Air Bengawan Solo, Jawa Tengah	Deductive	Revitalization, Tourism
Dhani & Intan, (2020)	Revitalisasi Tirtomoyo Sebagai Sport And Wellness Center Di Surakarta dengan Pendekatan Konsep Arsitektur Dekonstruksi	Observation, Literature Study	Revitalization
Sovie, (2016)	Revitalisasi Pasar Kayun Berbasis Sustainable Development	Quantitative, Observation	Revitalization, Sustainable
Nitish, (2020)	Sustainable Building Material for Green Building Construction, Conservation and Refurbishing	Observation, Literature Study	Sustainable Building
Timothy, Sylvia, Brian (2015)	Considering The Social Impact of Sustainable Stadium Design	Interviews, observations, Literature Studies	Sustainable
Dio, (2015)	Revitalisasi Gedung Olahraga Sidoarjo	Observation, Literature Study	Revitalization

2.2 Method

The author used a qualitative descriptive methodology in this study. research that aims to offer a thorough picture of the social environment or that seeks to explore and shed light on a phenomena or social reality The trick is to distinguish between the tested phenomena and a variety of variables connected to the problem and the units studied.

A research method known as a qualitative approach produces descriptive data in the form of spoken or written accounts of actual persons and observed actions. Qualitative research focuses on social issues and considers the emotions and perceptions of the study's participants.

3. RESULTS AND DISCUSSION

Sports Hall is located inside the Tumenggung Abdul Jamal Stadium Area which is located at Jl. Ahmad Yani, Muka Kuning, Kec. Sei Beduk, Batam City, Riau Islands 29433, Indonesia.

A. Site Analysis

Site analysis is an analysis that aims to identify all the factors that affect the building in a site which then these factors are evaluated for their positive and negative impacts.

Through this identification and evaluation, it will produce alternative solutions in planning the site. From the results of the tread has a flat contour of the soil. Then it is located in a strategic location, which is in the city center and adjacent to public facilities where people have easy access that can be reached by public transportation (Pangestiningrum et al., 2021).



Figure 1 : Contour Tread
Source : Writer, 2023

B. Noise

The site is surrounded by one arterial road and one collector road. These two roads are sources of noise against the site but with varying intensity of noise. The highest noise level comes from arterial roads, while local roads are also a source of noise but with lower noise levels.

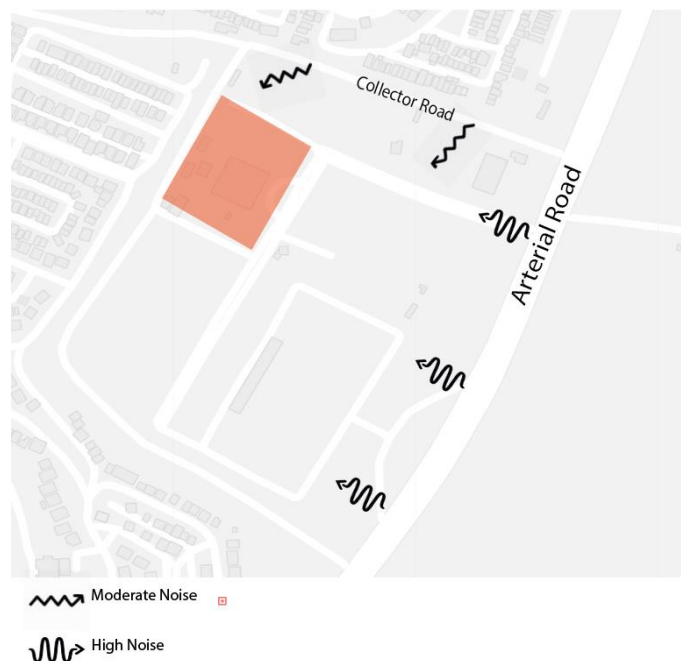


Figure 2 : Noise Analysis
Source : Writer, 2023

C. Vegetation

The vegetation around the site including quite a lot, especially in the western and eastern parts of the site, is quite dense with trees, with a lot of shading vegetation around the site making the site quite shady during the day.

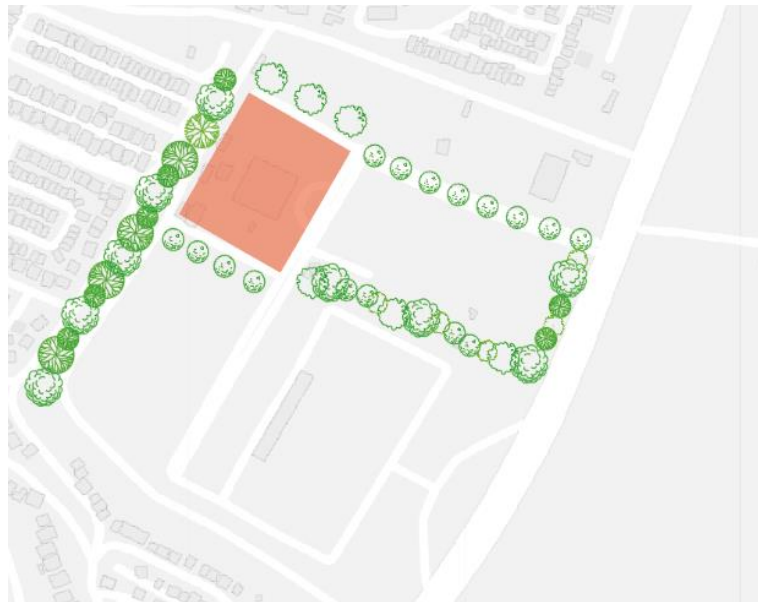


Figure 3 : Vegetation
Source : Writer, 2023

D. View In and Out

This Sports Hall is located inside the Tumenggung Abdul Jamal Stadium Area where the view to and from this site is nothing too interesting there are only many trees on the west and south sides of the site, while on the east side of the site there is only a field inside the Tumenggung Abdul Jamal Stadium area.



Figure 4 : View In and Out
Source : Writer, 2023

E. Sun

The position of the site is not perpendicular facing north and south but slightly tilted so that almost all sides of the tread will be evenly illuminated by the sun.

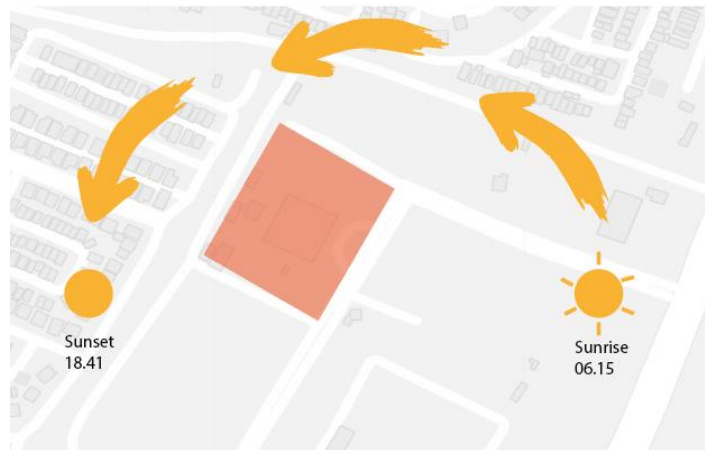


Figure 5 : Sun
Source : Writer, 2023

F. Building Analysis

The function of the sports hall is divided into three functions, the first is the function of exercising as a medium for coaching and developing sports which functions mainly as a means of increasing achievements for sportsmen and to increase the appreciation of community sports so as to create a climate of love for sports, then secondly the recreational function of users involved in sports activities directly or indirectly with the aim of recreation (Na'im and Sukada, 2022). And finally the social function as a means of communication about the world of sports both between athletes and athletes and athletes with the community even the sports hall has a contrast to society with its sportsmanship spirit (Firdausyah and Dewi, 2020).

G. Activity Identification

The elements of the actors and the nature of the activities that occur in sports facilities can be divided into two, namely sports activities consisting of training and competition activities. then there are also some Non-Sports activities such as service and management activities, athlete activities, and spectator activities.

H. Sustainable Architecture

A design idea is considered sustainable if it can satisfy the demands of its users in the present without jeopardizing the ability of future generations to satisfy their own needs (Wang and Adeli, 2014). In general, sustainable architecture is architecture that seeks to limit the negative natural effects of the environment and balance in the use of materials, energy, and the improvement of space and other broader environmental aspects. Sustainably sustainable architecture involves a conscious way of dealing with energy and biological protection in the design of the built environment or hypothesis, science and style of planned building structures built with no harm to ecosystem standards. Sustainable architecture must address human problems in terms of physical and mental comfort, well-being and aesthetics (Widyawati, 2018).

Sustainable architecture should be considered as a design carried out in accordance with the standards of environmentally friendly development principles and established

standards taking into account all issues related to the merger between environment and climate, energy efficiency, water and waste management, material productivity, and raw material management, local preferences as well as convenient and quality use (Aste et al., 2020). Some applications of sustainable architectural concepts that can be applied to buildings : (1) Energy Use Efficiency (Utilization of the influence obtained from the presence of sunlight for natural lighting in the building room to the maximum during the day, aims to reduce the use of electrical energy); (2) Land Use Efficiency (This means that it involves the use of current land as needed, not all land must be used as buildings because the current condition of the land requires more green land by utilizing land efficiently, compactly, and integratedly so that the building land has the potential to grow green plants on the land and maximize innovation in planting and utilization of land functions left in the environment); (3) Efficiency of Technology Use (Namely efficiency in the use of energy-saving technology. Then, maximize the utilization of sustainable energy potential, for example wind energy, irradiation from sunlight, and water to create home electrical energy for households and other buildings independently); and (4) Vegetation Adaptation Efficiency (The thing that can be applied is to maintain and take good care of the existing vegetation, it would be nice if it was added by planting ornamental and shade plants so that the area looks more beautiful. The presence of this vegetation can be useful for reducing vehicle pollution from the outside into the building).

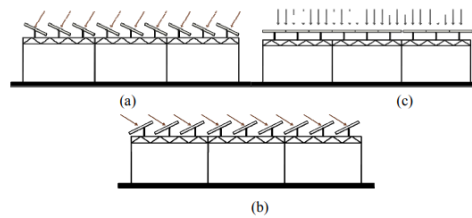
Based on some of the analysis and discussion above, there are several things that can be added to the sports hall building to further support the concept of sustainable building (To et al., 2018).

I. Use of Solar Panels

Overuse of fossil fuels as a primary source of energy has been a significant contributor to global warming. The burning of fossil fuels produces carbon dioxide emissions, which raise atmospheric temperatures. This indicates that there is an urgent need to deploy energy-saving measures to lower building energy use (Dudzińska, 2021).

Because solar energy is seen as a free and endless source of energy, using it will reduce the rate at which the earth's energy resources are exhausted. It also provides an alternate energy source that does not harm the environment. Solar energy, which is a renewable resource, is a powerful example of the vast energy potential that can outperform fossil fuels. Indonesia's weather is ideal for the installation of photovoltaics due to its nearly consistent weather patterns and availability of more than 10 hours of sunlight each day. Devices called photovoltaics produce all of their electricity from sunshine, are resource-free, require little to no maintenance, and do not significantly pollute the environment.

In general, solar systems that are mounted on the roofs of the structures in this arrangement are referred to as static systems. This fixed arrangement only makes the most of the sun's availability during a specific period of the day. The PV Panel in a dynamic system is pointed in the direction of the sun using a Sun Tracker device. This will maximize the quantity of electricity produced by the system by optimizing the time in the morning and evening by directing the concentration of sunlight to the focal point of the solar panel. The output of power can be increased by around a third, and some even as much as 40% in some places, when solar modules using tracking technology follow the sun's path (and maximize the sun's angle of incidence on its surface). This is in comparison to the usage of fixed-angle modules.



- (a) The panels are facing towards the morning sun, (b) The panels are facing directly in the afternoon sun, (c) The panels are facing in the afternoon sun.

Figure 6 : solar panel illustration

Source : Writer, 2023

Three different types of photovoltaic panels can be supported by the system, allowing it to move freely horizontally in accordance with the sun's direction (from east to west, from dawn until dusk). Figure 6 demonstrates how the position of the sun in the morning, midday, and evening are represented by the movement of the panel's base. The solar panel can be moved in such a way that it is perpendicular to the sun from morning till evening, maximizing sunlight.

J. Wastewater Management

Wastewater, often known as wastewater, is the leftover water that is released from homes, businesses, or other public areas and typically contains elements or substances that are potentially detrimental to human health and the environment (Al-Qawasmi et al., 2019). Although it is leftover water, the volume is large because approximately 80% of the water used for daily human activities is discharged again in a dirty (polluted) form. Furthermore, this wastewater will eventually flow into rivers and seas and will be used by humans again. Wastewater treatment to protect the environment from pollution (Catur et al., 2012).

The environment has a large enough carrying capacity against disturbances arising from wastewater pollution. However, nature has limited ability in its carrying capacity so that wastewater needs to be treated before being disposed of. There are several ways of wastewater treatment including Dilution, namely wastewater is diluted until it reaches a fairly low concentration then discharged into water bodies, Oxidation Ponds (Oxidation Ponds) in principle this treatment method is the use of sunlight, algae (algae), bacteria and oxygen in the natural cleaning process, and irrigation where wastewater is flowed into open ditches that are dug so that water will seep into the soil through the base and walls of those trenches (Adi et al., 2016).

4. CONCLUSION

Sports Hall building with the concept of sustainable building in Batam city still cannot be found, this is very good to be applied by revitalizing the Sports Hall Tumenggu Abdul Jamal Batam building by adding the use of solar panels and wastewater management. With this study, it is hoped that it can become a sports hall building with a sustainable building approach and also become a reference for those who will study this study in the future.

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