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CHILDREN CENTER WITH TROPICAL ARCHITECTURE APPROACH IN MEDAN CITY

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ABSTRACT

Improving Early Childhood Education quality is pivotal for Indonesia's Government in achieving Human Resource Development goals by 2045, coinciding with an anticipated golden age when 70% of the population will be of productive age. Among this demographic, 70% currently fall within the 0-6 age group, crucial for early brain development that significantly impacts adult intellectual abilities, with noticeable variability already evident by age 4. Challenges persist, as Indonesian early childhood faces delays in motor and cognitive development, prompting the government to prioritize supportive facilities. Medan City, as Indonesia's third-largest city, is experiencing rapid economic and social growth. Despite women's rights to contribute to the economy, low female labor participation rates in Medan reveal gender biases assuming women's primary responsibility for household and childcare duties. Therefore, facilities that support early childhood education and development are crucial to fulfilling children's rights and supporting working mothers. Children Centers in Medan City illustrate this approach, providing daycare services tailored for career mothers in a comfortable, tropically designed setting. Research employs a descriptive methodology, encompassing literature, theories, and relevant cases to shape effective policy and developmental strategies.

Keywords : *Children, Education, Development, Childcare, Tropical Architecture*

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ABSTRAK

Meningkatkan kualitas Pendidikan Anak Usia Dini (PAUD) adalah langkah penting bagi Pemerintah Indonesia dalam mencapai tujuan Pembangunan Sumber Daya Manusia pada tahun 2045, yang bertepatan dengan masa keemasan ketika 70% dari populasi berada dalam usia produktif. Dari kelompok ini, 70% saat ini berada dalam rentang usia 0-6 tahun, yang merupakan fase penting untuk perkembangan otak yang berdampak signifikan pada kemampuan intelektual di usia dewasa, dengan variasi yang sudah terlihat pada usia 4 tahun. Tantangan tetap ada, di mana anak-anak usia dini di Indonesia menghadapi keterlambatan dalam perkembangan motorik dan kognitif, mendorong pemerintah untuk memprioritaskan fasilitas yang mendukung. Kota Medan, sebagai kota terbesar ketiga di Indonesia, mengalami pertumbuhan ekonomi dan sosial yang pesat. Meskipun hak perempuan untuk berkontribusi dalam perekonomian diakui, tingkat partisipasi tenaga kerja perempuan yang rendah di Medan mengungkapkan adanya bias gender yang menganggap tanggung jawab utama perempuan adalah mengurus rumah tangga dan anak-anak. Oleh karena itu, fasilitas yang mendukung pendidikan dan perkembangan anak usia dini sangat penting untuk memenuhi hak anak-anak serta mendukung para ibu yang bekerja. Pusat Anak di Kota Medan menjadi contoh pendekatan ini, menyediakan layanan penitipan anak yang dirancang untuk para ibu karier dalam lingkungan yang nyaman dengan desain tropis. Penelitian ini menggunakan metodologi deskriptif, mencakup literatur, teori, dan kasus-kasus relevan untuk membentuk kebijakan dan strategi pembangunan yang efektif.

Kata kunci: Anak-anak, Pendidikan, Perkembangan, Pengasuhan Anak, Arsitektur Tropis

1. Introduction

Improving the quality of Early Childhood Education is a target pursued by the Government of Indonesia in achieving its Human Resource Development goals by 2045 (Siregar & Eddy, 2024). In that year, Indonesia is expected to enter a golden era by obtaining a demographic bonus, where 70% of the total population is in the productive age range (Lubis et al., 2024). Most of them are children aged 0-6 years, which is an early period of life where intellectual development is rapid. As much as 50% of the variation in a person's intelligence already occurs by age 4, with a further 30% increase occurring by age 8, and the remainder by mid- or late childhood (Rumahorbo & Sembiring, 2024). Therefore, the process of forming brain intelligence during the golden period of children is very important because it will affect their intellectual abilities as adults.

Early childhood education plays an important role in shaping a superior, productive and competitive golden generation in the future. Considering that Indonesia will enter the golden age in 2045, where 70% of the population is in the productive age range, most of whom are children aged 0-6 years.

Unfortunately, the government's efforts to create a golden generation are still not fully realized, as stated by the Chairperson of the Coordinating Work Unit (UKK) of Social Growth and Development-Pediatrics of the Indonesian Pediatric Association (IDAI), Dr.dr. Eddy Fadlyana, MKes. SpA(K), that Indonesia, as a developing country, experiences delays in early childhood motor and cognitive development. The lack of educational facilities for early childhood is one of the main factors in not meeting the needs that support children's motor and cognitive development in Indonesia. Early childhood education has an important role because their development at this stage will affect the next stage. The need for a form of service such as a children's center, where various activities such as intellectual education, creativity exploration, talent

development, and others can be carried out.

Therefore, especially the Medan city government is encouraged to provide educational facilities that support early childhood. This is also an effort to actualize Medan city as a child-friendly city (KLA). Until 2020, Medan City did not have facilities that support creative and recreational activities for children outside the school environment that can be accessed by all children. There is only one accredited children's playground in Medan City (Harisdani & Santoso, 2024).

The total population of Medan City reaches 2,494,512 people, with the number of people aged 0-4 years is 202,591 people and the number of people aged 5-9 years is 195,350 people(Hidayat & Zahrah, 2017). From this amount, almost one-sixth of the total population of Medan City are children. The comparison of the population and existing facilities shows that Medan City still needs a lot of effort in fulfilling facilities to support early childhood education activities.

Medan City being the third largest city in Indonesia and experiencing rapid economic and social development, female labor force participation is still low, reaching 46.27% (Clarita & Pane, 2022). This figure shows the low participation of women in the workforce. This is due to gender discrimination and the perception that women are primarily responsible for household duties, especially in terms of childcare and education. In order to increase the productivity of women workers who have children, it is necessary to provide child-friendly daycare as an alternative care. The development of child-friendly daycare is one of the strategies in achieving the targets of the 2020-2024 National Medium-Term Development Plan (RPJMN) and has been required by the Minister of Women's Empowerment and Child Protection Regulation Number 5 of 2015 concerning the Provision of Gender-Responsive and Child-Caring Work Facilities in the Workplace.

Based on Medan City Employment Statistics in 2022, it can be taken that the age group that is estimated to have early childhood and who are predicted to have children, is the working women with the age group of 20-34 years with a total number of 164,006 people and women who work as labourers/employees have the highest number with a total of 204,984 people, whose main work status is nine to five. So, they need a daycare as a temporary alternative care. Based on the background that has been mentioned, it can be concluded that there is a need for a facility in the form of a Children Centre that can support the education and development process for early childhood with daycare facilities as an alternative care for working mothers in Medan City as well as an effort to increase the productivity of female workers.

Medan City has a tropical climate with significant temperature variations. Based on data from BBMKG Region I Station and Sampali Station in 2019, the lowest temperature reached 21^{0}C, while the highest temperature reached 39^{0}C (Iskandar, 2022). The average air humidity of Medan City is 83% and According to Sampali Station, the average rainfall per month in Medan City in 2019 was around 157 mm, thus falling into the medium rainfall category (100-300 mm). With these conditions, a tropical architecture approach is used to produce a building that can support the growth and development of children with a comfortable environment.

Literature Review

Children Center

Children Center is a centre for children and is intended for children, especially for early childhood. A Children Centre is a place or container that provides special facilities designed and used to support educational activities, games, talent development, creativity, sports and health in Medan City.

Children Centre is a social service related to children, parents or prospective parents as well as aiding in accessing employment and training for parents, as well as providing information and assistance to parents on childcare and other relevant services (Aulia & Mahwani, 2020).

A Daycare Centre, often abbreviated as TPA, is a facility that provides group care for children, usually during parents' working hours. It is designed as a structured initiative to care for children outside the home environment for a few hours a day. It is important to note that day care centres act as an adjunct to the parents' role in caring for children, not as a substitute (Sorin & Gordon, 2013).

Day care is a social institution that organises activities such as socialisation, care, nurturing, and education especially for toddlers. This is done as an effort to support families in fulfilling some of their responsibilities in providing protection and fulfilling the rights of their children (Nasution & Zahrah, 2018).

Function of Children Center

1. As a forum for education, development of interests and talents as well as a safe playground for children.
2. As a comprehensive service that increases the productivity of working parents by taking into account the developmental needs of their children (Siregar & Eddy, 2024).

Activities at the Children Center

1) Educational, educating children with various activities and also a daycare centre.
2) Recreational, providing recreational games for children, by providing indoor, outdoor playgrounds and other entertainment facilities.
3) Commercial, preparing commercial facilities by providing shops that sell goods that can support activities in the children centre, such as bookstores, school supply stores, musical instrument stores and food stores.

Target and Scale of Children Center Services

The children centre can be a facility that can provide a space for learning about life so that they can explore independently with a variety of scales, textures and activity options (Bawole, 2010).

General Purpose of Children Center

The children centre can be a facility that can provide a space for learning about life so that they can explore independently with a variety of scales, textures and activity options (Harahap et al., 2021).

Comfort Factors in Children Center

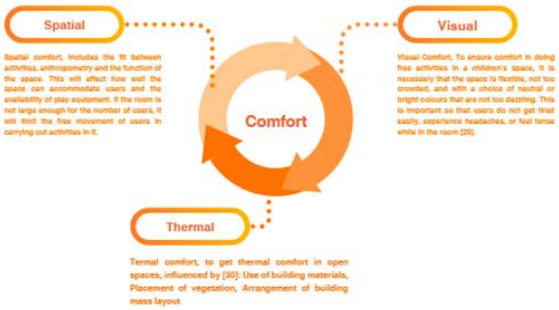


Figure 1 Comfort Factors

Types of Space as a Play Environment for Children

Here are 5 categories of play space as a description of space by children :

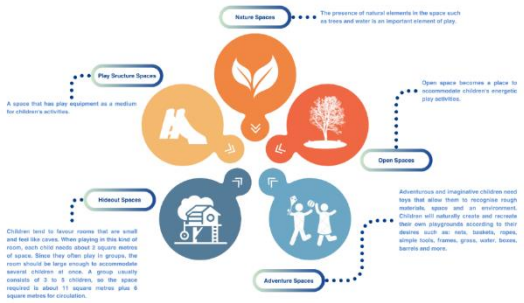


Figure 2 Categories of Play Space

Space Requirements for Children Center

There are several space requirements such as (Wadley & Parasati, 2000):

Figure 3 Space Requirements

Provisions on accessibility aspects such as (Aulia & Mahwani, 2020):

Figure 4 Accessibility Aspects

Children Center Facilities and Infrastructure Standards

Figure 5 Facilities and Infrastructure Standards

Tropical Architecture

Tropical Architecture is an approach to building design that addresses the challenges commonly faced in the tropics. The tropical climate, with its high temperatures and humidity, affects the comfort of building occupants (van Roosmalen, 2020). The concept of Tropical Architecture encompasses design strategies that aim to address problems arising from the tropical climate, such as intense sunlight, high temperatures, rainfall, and high humidity (Lippsmeier, 2005).

Characteristics of Tropical Architecture

The characteristics of the tropical climate and its impact on common building-related problems are as follows (Lubis et al., 2024):

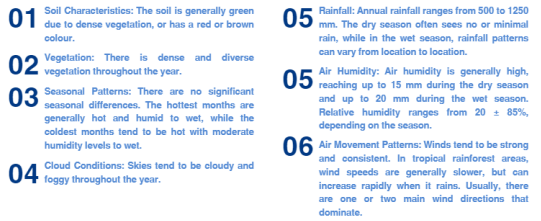


Figure 6 Characteristics of Tropical Architecture

Principles of Tropical Architecture

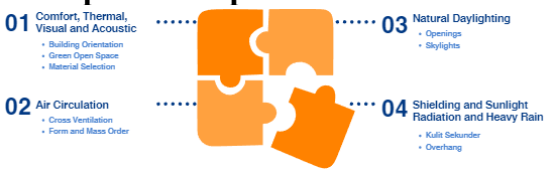


Figure 7 Principles of Tropical Architecture

Application of Principles to Design

Figure 8 Principles of Tropical Architecture

2. Method

The research stage begins with the selection of the location. The selected location located in Jl. Karya Wisata by considering the elements and requirement, such as, spatial plans, reviewing government regulations and city utilities. Data collection methods are classified into two types. Primary data is the result of observations from a direct survey of the location. Then for secondary data is data through books, standards, comparative

studies and journals with similar projects. Furthermore, the data that has been collected will be analyzed to solve the design problem and developed into a design concept.

3. Result and Discussion

Design Location

The location of this project is in Jalan Karya Wisata, Medan Johor Sub-district. This area is a high density residential and trading area. One of the supporting facilities in the area is the City Park and Urban Forest. This location is connected to 1 main road, Jl. Karya Wisata and 1 connecting road, Jl. Karya Darma, but this road is still under development and to be able to continue to Jl. Karya Wisata - Jl. Karya Jaya. The development of this road will be realized in accordance with the RDTR and Zoning Regulations of Medan City 2015-2035 of Medan Johor Sub-district.

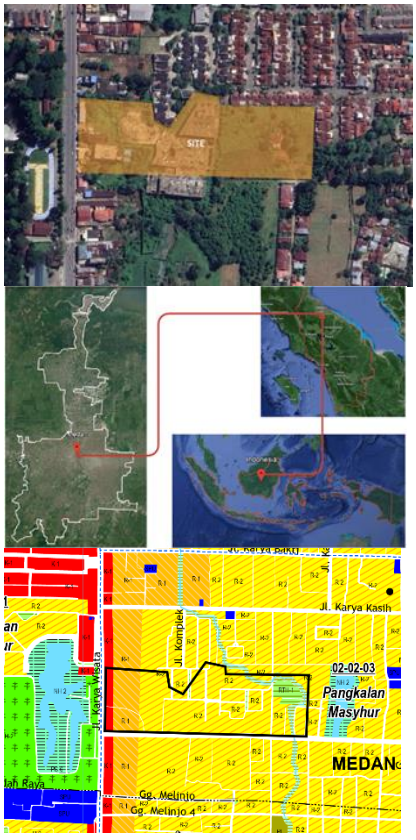


Figure 9 Project Location & Medan City Spatial Plan Pattern

Program Planning

Activity Program Analysis

Types of Children Center Services

a. Facilities for Early Childhood Education, ages birth-6 years old.
b. Childcare, ages birth-6 years old.

Activity time

a. Age 0-2 years: one meeting of at least 120 minutes, with the involvement of parents, and a minimum frequency of meetings of once per week.
b. Age 2-3 years: one meeting of at least 180 minutes and a minimum frequency of meetings of twice per week.
c. Age 4-6 years old: one meeting of at least 180 minutes and a minimum frequency of five meetings per week.

Activity Development Program

1. Religious and moral values, this program aims at the realization of a learning atmosphere to develop good behavior from religious and moral values.
2. Physical-motor, this program aims at the motor and kinesthetic development of children which is realized in play activities.
3. Cognitive, this program aims to support the development process of children's thinking.
4. Language, this program aims at a learning atmosphere for the development of language maturity.
5. Social-emotional, this program aims to support the process of developing attitudes, environmental sensitivity, social skills and emotional maturity.
6. Art, this program is carried out in supporting the developmental process with art exploration, expression and appreciation activities that are realized in the context of play.
7. Health, this program is carried out aimed at children who experience illness or delays in the growth and

development process with the implementation of counseling and therapeutic stages tailored to the delays experienced.

Time of Service

There are 3 categories, namely Full day, Full day is organized for one full day from 07.00 to 18.00, to serve students who are entrusted either at any time or entrusted regularly/every day. Half day, Half day is organized for half a day from 7:00 to 12:00 or 12:00 to 18:00. Conditional, only attending certain classes and therapies.

Zoning Concept

Zoning is divided into 4 sections, namely public, semi-private, private and service area. Public area is the entrance, administration building and building for children's therapy. Semi private is a building for education and child development. Private is the building for the preparation room and childcare. Service Area is an area for utility rooms (Figure 10)

Figure 10 Zoning

Accessibility Concept

There are two accesses to the building, namely Jl. Karya Wisata, which is the main access to the building and can be accessed by motorcycles, cars, buses and pedestrians. The second access is through Jl. Karya Bakti, this access is used for service activities. (Figure 11).

Figure 11 Accessibility

Circulation Concept

The circulation concept is divided into 3, namely circulation for pedestrians who also connect to the bus stop, motorcycle circulation that goes directly to the basement parking, and car circulation that enters the site to drop off and then to the basement. This circulation is used for visitors and managers such as teachers through Jl. Karya Wisata. For service circulation through Jl. Karya Bakti (Figure 12).

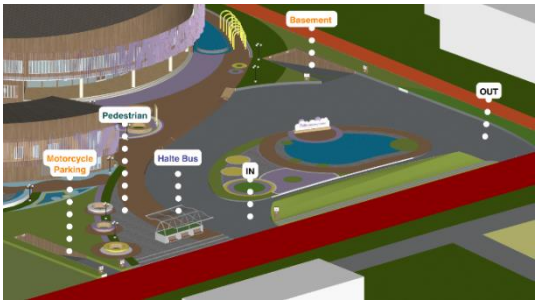


Figure 12 Circulatio

Landscape Concept

The division of outdoor space is categorized based on public and private (children) use. The parts accessible to the public are the entrances, pedestrian paths and bus stops. Private areas are inside the building and around the building. The outdoor space is used for children's play areas, gardening areas and also exercise. The outdoor space in the service area is used for loading dock (Figure 13).

Figure 13 Landscape

Response to Site

The entrance and exit access are spaced, then a detour is also provided within the site to facilitate the process of detouring if the child has not yet appeared, thus giving space and time to wait and pick up again so that there is no queuing or accumulation that causes congestion. The building faces east and west where part of the building in that direction will get direct sunlight, so minimize openings in the east-west direction and also apply secondary skin.

Tropical Architecture Approach

Building Orientation

This building is oriented towards the south by placing the widest area of the building on this side so that it will get optimal light exposure without being exposed to hot sunlight. In the part where the building is oriented towards the west, the treatment does not place wide openings on that side (Figure 14).

Natural Lighting

Each building is directly integrated with outdoor space, so the placement of openings for natural lighting can be optimized (Figure 14).

Figure 14 Building Orientation

Natural Ventilation

The shape of the building is designed to absorb as much wind as possible to optimize natural ventilation. Wind breaking vegetation is used as air filtering and as a barrier against too strong wind currents. The environment, which is generally empty land, increases the possibility of strong wind currents, so in bordering areas it is planned to place a garden area in that area so that wind currents will be filtered in such a way (Figure 15).

Figure 15 Natural Ventilation

Heat Temperature Reduction

Building protection uses secondary skin on the side of the building that faces east and west sunlight as protection against rising temperatures in the building. Providing a pool in an area exposed to east-west light can also reduce the temperature of the building. Using a membrane in the outdoor play area provides more opportunities and comfort for children's play activities by providing protection from tropical weather, namely with high rainfall and strong sunlight (Figure 16).

Figure 16 Heat Temperature Reduction

No	Picture	Application of Tropical Architecture

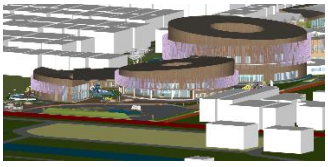
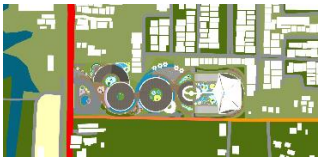
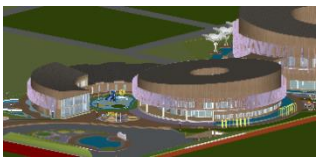
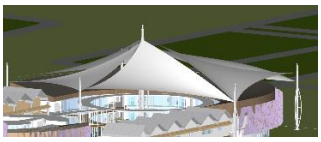
1		Each building is oriented towards the south by placing the widest area of the building on this side so that it will get optimal light exposure without being exposed to hot sunlight.
2		The use of openings is maximized on buildings facing north-south. These openings will facilitate air circulation to the building.
3		The use of secondary skin on the building to protect from direct sunlight and heat.
4		The water element with the pond around the building aims to help reduce the sun's heat on the building.
5		All buildings have direct access to outdoor spaces, so as to maximize sunlight, air circulation and also be close to nature.
6		The use of sloping roofs as an adaptation to tropical weather, especially high rainfall.
7		The membrane roof in the children's playroom area is used to maximize children's play activities without being disturbed by the sun's heat and rain.

Table 1 Application of Tropical Architecture in Buildings

4. Conclusions and Suggestions

Children center with tropical architecture approach is designed to be a place for early childhood to be able to help the process of their development, provide space in the exploration of interests and talents, as well as a place of care and childcare. Adapting to the tropical environment so that this children center can be optimal in creating a building that can provide a sense of happiness, comfort and safety to be able to support all activities in it.

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