

Sustainable Environmental Study for Age Friendly City in the Island: Case Study of Tidung Island

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Abstract:- Development is a process of change for the better. Development must also pay attention to the important things that support each of the development process itself. The problem that arises in development in general is that there are aspects that are disadvantaged. With the rate of population growth and the increase in human needs, development can have an impact on the environment being sacrificed as a result of fulfilling human needs while between humans and the environment there is a reciprocal relationship. One of the problems in development is that there are no child-friendly and elderly-friendly cities (age-friendly cities) as a whole in the regions of each province in Indonesia. For this reason, this research was conducted to examine the sustainable environment for age-friendly cities, especially in the islands by taking the case study of Tidung Island, the Thousand Islands. Based on the results of research conducted on Tidung Island, it is proven that Tidung Island still cannot be said to be an age-friendly city, this can be proven by the incomplete facilities that support the realization of an age-friendly city.

Keywords:- Age Friendly City, Tidung Island, Sustainable Environment, Child Friendly City.

I. INTRODUCTION

In a country, children are a very important asset and are the future of the nation's resources, they will determine in terms of the quality of development in their territory. Therefore, children must be given protection and serious attention from all elements of urban society. Socially, children may not be able to deal with waves of social problems that can directly or indirectly interfere with their mental development. This can also be proven by the increasing cases of child problems. Based on data from the Central Statistics Agency (BPS) in 2021, there are 30.83 million early childhood children in Indonesia. Of the total number of early childhood children, 13.56% are infants (aged less than a year), 57.16% are children under five (aged 1 to 4 years) and 29.28% are preschool children (aged 5 to 6 years). One of the causes of various social problems is the non-execution of shared responsibility for children's rights, especially for the 3 (three) pillars of development consisting of social, economic and environmental where sustainable development aims to carry out development to meet current

needs without compromising the needs of future generations. future by emphasizing or focusing on the carrying capacity of the environment, the achievement of social justice, economic and environmental sustainability. Then another problem that arises is at the level of health and public health, the age structure of the Indonesian people also increases due to the increase in life expectancy. This will have an impact on the number and proportion of the elderly population which also increases where an increase in the life expectancy of the Indonesian population will also have an impact on an increase in the number of elderly people. Why was the research site chosen on Tidung Island? The Thousand Islands, which is located between the Java Sea and the Jakarta Bay, is an area that has different natural characteristics and potential from the DKI Jakarta area, although it is still within the administrative area of DKI Jakarta because basically this area is formed from a cluster of coral reefs from natural processes. Tidung Island is one of the islands in the Thousand Islands group and the livelihoods of the people on Tidung Island are generally fishermen, seaweed farmers, traders and civil servants. The income of residents on Tidung Island mostly comes from tourism. In the life of the people in the islands, it is very interesting to conduct research on the lives of children and the elderly where in general the utility needs of the community, especially for children and the elderly, are generally neglected, for that reason This research was conducted on the basis of the need for a study of the utility needs of the community, especially for children and the elderly in the archipelago by utilizing local resources. The formulation of the problem from this research is how the condition of the built environment on Tidung Island towards the activities of children and the elderly, the problems of the built environment in the archipelago in general are the waning of age-friendly values, environmental damage, energy crisis and lifestyle shifts and how the condition of regional utilities in the area is. Tidung Island, research is needed on supporting facilities for the activities of children and the elderly in the islands. The research that was carried out in March 2022 has the objectives of, among others, to find solutions to problems for sustainable development, especially regarding child-friendly cities and elderly-friendly cities by utilizing local resources in the islands and to examine the condition of regional utilities in the islands, especially on Tidung Island. and to obtain sustainable development standards for the archipelagic region. In research on how a child-friendly city and an elderly-friendly city, of course,

there will be many problems that can be discussed, but in this study the limitations of the problem to be discussed are regarding the study of the utility needs needed for children and the elderly as well as a study of the activities of children and the elderly in the Tidung Island area. Then the benefits of this research are divided into 2 (two) parts, namely for local governments and for science. For local governments, the results of this study are expected to become a reference or standard for urban planning regarding the utility of facilities and infrastructure needed for the needs of children and the elderly, especially in the archipelago.

II. METHODOLOGY

The paradigm in this research method that has been described previously is that there has been no research on child-friendly cities and elderly-friendly cities on Tidung Island and in the Islands so that the idea emerged to conduct research on this matter on Tidung Island so that the results of this study are expected to be a standard reference for planning child-friendly city and elderly-friendly city in the Archipelago while the method used is a qualitative descriptive survey method where qualitative research is a research procedure that produces descriptive data in the form of written words from people and observed behavior (Moleong, 2007). The research approach used is narrative research, basic theory and observations of actual phenomena that occur in the field based on case studies and surveys conducted on Tidung Island. In this study, data analysis was carried out by means of field observations, interviews, field data collection and literature review so that it would obtain useful information that became the basis for decision making as a conclusion, observations were carried out directly at the Tidung Island location which aimed to collect data. supporters of this research.

III. RESULT AND DISCUSSION

- a) Tidung Island regional government
The Thousand Islands Administrative District consists of 2 (two) Districts, namely the North Thousand Islands District and the South Thousand Islands District and consists of 4 (four) RWs and 29 (twenty-nine) RTs. In this case, Tidung Island is included in the District of the South Thousand Islands with the District office located on Tidung Island. In addition to the sub-district office, there is also the Tidung Island Village office. In accordance with Article 32 of Law no. 34 of 1989, that the Thousand Islands District, which is part of the DKI Jakarta Province, was upgraded to the Thousand Islands Administrative District with the aim and purpose of improving public services and welfare in all aspects, including environmental sustainability, conservation of natural resources, economy, community welfare. and socio-cultural.
- b) Population
The name Tidung Island comes from the word Tidung (in the dialect of the local population at that time) which means a shelter because this island in the past was often used as a shelter from pirates or pirates. Tidung Besar Island has been inhabited by residents since the Dutch colonial period. Tidung Besar Island is the largest island in the Tidung Island village, where the area on Tidung Besar Island is 50.13 Ha with a population of about 5,767 people with 1,634 families (data from Tidung Island Village, 2022). From the population of 5,767 people mentioned above, 1,511 people are school-aged children and based on BPS data in 2015 the number of elderly people (over 65 years old) on Tidung Island is 89 people, while the types of livelihoods for Tidung Island residents generally consist of fishermen, traders, seaweed farmers and civil servants (PNS).

No.	Zone	Type of livelihood			
		Fisherman	Marketeer	Seaweed Farmer	Government officials (PNS)
1	RW 01	84	63	2	45
2	RW 02	72	105	7	53
3	RW 03	124	94	25	32
4	RW 04	114	49	-	29
Total		394	311	69	159

Table 1: Tidung Island Village Office Data, 2022

Based on data from the Tidung Island sub-district in 2022, the types of livelihoods of the residents on Tidung Besar Island to the total number of working people, the data obtained are as follows:

- There are 42.22% have a livelihood as a fisherman.
- There are 33.33% have a livelihood as a trader.
- There are 7.39% have a livelihood as seaweed farmers.
- There are 17.04% have a livelihood as civil servants.

Of the total population of Tidung Besar Island (5,767 people), 26.20% are school-aged children.

- c) Open space
Open spaces are spaces that can be used as facilities and infrastructure to improve the quality of the living environment for the better. This open space generally has a function as environmental sustainability, socio-cultural, sports and children's play area where based on Government Regulation no. 21 of 2021 that the area of green open space has a total area of 30% (thirty percent) and this proportion must be maintained.

The open spaces found on Tidung Island include:

- RPTRA (Child Friendly Integrated Public Space).
- Love bridge beach tourist spot.
- Tidung Island harbor area.
- TPU (Public Cemetery).
- Fields on the outskirts of residential areas.

Based on DKI Jakarta Governor Regulation No. 123 of 2017, Child Friendly Integrated Public Spaces (RPTRA) must have a minimum area of 750 m² and if certain areas do not have sufficient land, they can be allowed to use land areas that are adapted to the conditions of the area. In the Tidung Besar Island area, there are 2 RPTRA locations, namely RPTRA Tidung Ceria and RPTRA Taman Anak Kecamatan. In addition to the needs of a playground or a place for children's creative activities, the RPTRA is also used as:

- Integrated Service Post (Posyandu).
- PKK main program activities.
- Art activities.
- Community sports venue.
- Children's library (children's reading park).
- Disaster services (refugee and post-disaster services).

The love bridge beach on Tidung Island is an icon of Tidung Island because it is in a tourist area. In this place there are many community activities, such as sports (swimming,

beach snorkelling), watching sunset and sunrise, beachside culinary tours, playing sand beaches, walking on the beach and crossing the bridge of love to get to Tidung Kecil Island. In the main port area of Tidung Island there is a building in the form of a pavilion that can function as a place for art and performances for local residents, besides that in this port area there is a large parking lot so that it can be used by children as a place to play. On Tidung Besar Island there is 1 (one) TPU location with a land area of 10,180 m² where the TPU is well laid out so that it looks well-maintained, beautiful and does not create a spooky impression so that children on Tidung Besar Island can use this location as a place to play.

The problem faced by the regional government on Tidung Island is the limited TPU land for the burial of residents, from a capacity of 1,712 grave plots, 1,412 grave plots have been filled so that until now there are only 300 grave plots left. The expansion of the tomb is constrained by the fact that most of the land on Tidung Besar Island already belongs to the community, so land acquisition requires a fairly expensive (high) cost. As an alternative, the possibility of expanding the TPU area will be in the Tidung Kecil Island area. Furthermore, the open land on Tidung Besar Island which is usually used by children as a playground is located on the outskirts of residential areas in the western and eastern parts of Tidung Besar Island. Children to get to this place using motorcycle or bicycles.



Fig. 1: RPTRA at Tidung Besar Island

d) Pedestrians

In the Tidung Besar Island area, road conditions generally have a width of 3 meters for the main road made of paving blocks and environmental roads with a width of 2.5 meters are also made of paving blocks. While in coastal areas, road access is generally made of concrete pavement with a width of 2.5 meters.

Based on the results of field observations, on the access road on Tidung Besar Island there is absolutely no pedestrian path (pavement) for pedestrians and can be dangerous for the elderly and children because the paving block road is not flat on the surface so it is prone for the elderly and children to stumble. safe to use road access).

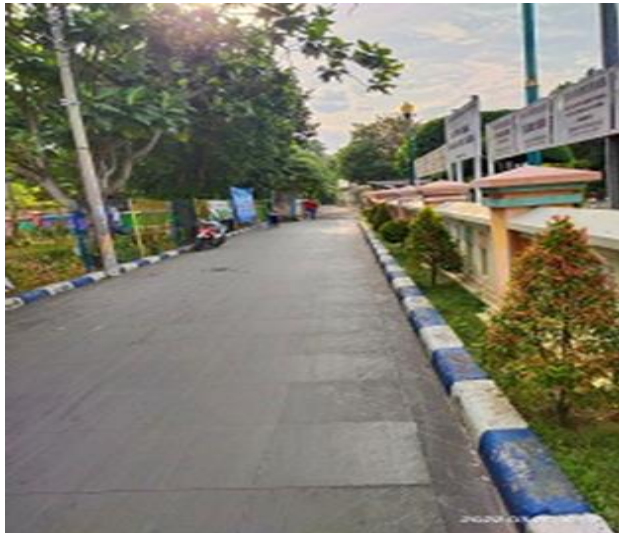


Fig. 2: Pedestrians at Tidung Besar Island

- e) Age-friendly building shape and mass

The definition of an age-friendly building here is a building that functions as a forum for the community, especially for the elderly and children in welfare services and healthy building conditions to support the implementation of social services. The criteria for age-friendly buildings are as follows:

 - a. Floor.

Have a non-slippery floor and you should use a textured floor so that the elderly and children do not slip easily.
 - b. Furniture.

Efforts are made to use sufficient furniture (not many items) so that the space for movement is limited, it is feared that items will fall so that it is dangerous for the elderly and children.
 - c. Ladder

If there is a ladder, try not to make the stairs too high and the slope of the stairs is made as smooth as possible and there are railings for handrails so that

parents and children have no difficulty using the stairs access.

- d. Toilet.

We recommend using a sitting closet and there are handles around it to help especially the elderly in activities in the bathroom.

- e. Bedroom.

The bed should not be too high so that it can provide comfort for the elderly and children to get up and down from the bed.

- f. Surrounding environment.

It is better if the environment around the place of residence can support activities for the elderly and children such as being close to the stall so that the elderly can take it on foot and it is affordable from the security office and the environmental road conditions have pedestrians or environmental roads are not bumpy (uneven).



Fig. 3: Building shape and mass at Tidung Besar Island

When viewed from the shape of the mass of buildings on Tidung Besar Island, it can be seen that there are still buildings that have not been able to meet the criteria as age-friendly buildings due to, among others:

- Still using quite a lot of furniture or inefficient furniture layout.
- In general, they still use a squat closet and there are no handles around it, making it difficult for the elderly to move in the bathroom.
- There are still stairs that are too high and the slope of the stairs is not sloping so it can make it difficult for the elderly to use this access.
- The neighborhood roads are made of uneven paving blocks, which pose a tripping risk for the elderly and children.

f) Transportation in the city

What is meant by age-friendly transportation is transportation that is safe and easily accessible or that provides special services (both facilities and the environment) especially for the elderly or disabled. In general, public transportation is the main choice for



Fig. 4: Transportation at Tidung Besar Island

g) Education and health facilities

According to Fitzgerald and Caro (2014), an age-friendly city ideally offers an environment that supports city dwellers to grow actively in their families, neighborhoods and communities supported by infrastructure and services that accommodate their needs. The environment here is very influential on housing, health and social services as well as educational services in managing the needs of city residents, based on this it is clear that education and health facilities are one of the important factors in realizing an age-friendly city.

In the area of Tidung Besar Island there are 9 (nine) school buildings, which consist of:

- SD (Elementary School) as many as 4 school buildings.
- MIN (Islamic Madrasa) as 1 school building.
- SMP (Junior High School) as 1 school building.
- SMK (Vocational High School) as 1 school building.
- MTs (Madrasah Tsanawiyah) as 1 school building.
- Aliyah as much as 1 school building.

the elderly. In the city on Tidung Besar Island there are only 3 (types) of transportation, namely:

- Bicycle.
Generally used by school children, tourists visiting Tidung Besar Island and residents to travel to the market.
- Motorcycle.
Generally used by residents who work as employees (PNS or honorary), traders and farmers and fishermen.
- Motorized rickshaw (bentor).
Usually used for tourist purposes for tourists visiting Tidung Besar Island.

If there are residents, especially the elderly who are sick, then in general they use 2 (two)-wheeled motorized vehicles or bicycles to take them to the puskesmas and if the local puskesmas cannot handle the patient's illness, usually the puskesmas will refer to Pramuka Island and the patient will be escorted by boat or boat owned by residents to Pramuka Island. Based on the above, it can be said that transportation within the city on Tidung Besar Island still cannot be said to be age-friendly transportation.

If there are residents who want to continue their education to the high school or university level, then they must take the education in the city of Jakarta. For health services on Tidung Besar Island, there is already 1 (one) puskesmas building which functions as health services for local residents. Based on data from the Tidung Island 2022 village, it is known that 85.95% of the total population on Tidung Besar Island is 5,767 people who have registered with BPJS.

The obstacle faced for health services on Tidung Besar Island is that if the patient cannot be treated by the local puskesmas due to limited medical equipment, the patient is usually referred to a hospital in Jakarta. On Tidung Island, there are 9 (nine) posyandu and 3 (three) posbindu.

According to the Ministry of Health of the Republic of Indonesia (2006), posyandu is a forum for health care and family planning carried out by and for the community under the guidance of relevant officers. The purpose of the posyandu here is to reduce infant mortality and maternal mortality or childbirth and to develop health activities (including family planning) and other activities that support the achievement of a healthy and prosperous society. Integrated Development Post (Posbindu) is an activity forum

for monitoring and early detection of risk factors for non-communicable diseases (such as heart disease, diabetes, lung disease, asthma and cancer) and disorders due to accidents and acts of domestic violence. The implementation of

posbindu on Tidung Besar Island is carried out by existing health cadres who have been specially trained, fostered and facilitated by the kelurahan with the criteria for posbindu cadres with a minimum of high school education.

Building Type	Zone				Total
	RW 01	RW 02	RW 03	RW 04	
Home residents	249	281	292	212	1.034
School building	2	3	3	1	9
Government Building	1	21	6	1	29

Table 2. Tidung Island Village Office

Data, 2022

No.	Zone	Amount of Health Insurance BPJS	Posyandu	Jumantik	Posbindu
1	RW 01	1.200	2	8	1
2	RW 02	1.255	2	8	1
3	RW 03	1.470	3	10	1
4	RW 04	1.032	2	7	
JUMLAH		4.957	9	33	3

Table 3. Tidung Island Village Office Data, 2022

According to the Ministry of Health of the Republic of Indonesia (2004), jumantik is a working group recruited by the local community who has the task of monitoring or checking larvae on a regular basis and mobilizing the community in carrying out eradication of mosquito nests that cause dengue fever (DHF). Integrated Development Post (Posbindu) is an activity forum for monitoring and early detection of risk factors for non-communicable diseases (such as heart disease, diabetes, lung disease, asthma and cancer) and disorders due to accidents and acts of domestic violence. The implementation of posbindu on Tidung Besar Island is carried out by existing health cadres who have been specially trained, fostered and facilitated by the kelurahan with the criteria for posbindu cadres with a minimum of high school education.

h) Clean water facilities

According to Mawardi (2014), water is a very important natural resource and is needed to determine the sustainability of the life of all creatures on this earth and is a basic need to carry out various household activities, industrial needs, trade needs,

livestock needs etc. Fulfillment or availability of clean water is also one of the requirements in realizing an age-worthy city. In the area of Tidung Besar Island, the need for clean water is managed by PDAM with a seawater distillation system converted into clean water. At the installation there are 3 (three) tanks with a tank capacity of 74 m³ each and this system of distilling seawater into clean water has been realized since 2020 which is a program from the government of the Republic of Indonesia in collaboration with the government of the Republic of South Korea. From the seawater distillation system, it has been able to serve 70% of the 5,767 inhabitants of Tidung Besar Island, while the remaining 30% still uses groundwater and in general the groundwater conditions are like seawater, which tastes brackish or slightly salty. The weakness of the seawater distillation system into clean water is that from each intake of sea water it can only produce only 30% of which succeeds as clean water, while 70% fails to become clean water due to the high mineral salt content.



Fig. 4: Clean water facilities at Tidung Besar Island

i) Facilities of electrical energy

Electricity is a basic need for all levels of society, because there will be almost no social activity without using electricity. One of the concepts of an age-friendly city is the availability of an electricity connection which is closely related to the fulfillment of the basic rights of the community, both children and the elderly, to a decent place to live (ownership of an electric connection in the house or residence). The availability of electricity connections on Tidung Besar Island initially relied on the Diesel Power Plant (PLTD), but over time the current availability of electricity for Tidung Besar Island is carried out by supplying electricity via submarine cables sourced from the Teluk Naga Substation in Tangerang. It is clear that there are disadvantages when using an underwater power cable network. According to information obtained from local PLN officers, there was once a problem with the underwater cable network being cut off by sea crabs, resulting in a power outage due to the repair of the cable network. For example, if the submarine cable network is cut off between Payung Island and Tidung Island, there will be power outages on Payung Island, Tidung Island, Harapan Island, Pier Island to Panjang Island and Pramuka Island until the disconnected cable network is repaired. Therefore, it is necessary to think about alternative solutions to provide electrical energy sources for Tidung Island, especially those from renewable energy sources.

j) Waste water treatment plant

Based on the UNICEF Innocenti Research Center (Ministry of Women's Empowerment and Child Protection of the Republic of Indonesia, 2016), one of the rights of children and the elderly as city residents is the right to get clean water and have access to good sanitation, therefore a wastewater treatment plant (IPAL)) is very important for the realization of good sanitation. A waste water treatment plant (WWTP) or it can also be called a Waste Water Treatment Plant (WWTP) is a structure designed to remove biological and chemical waste from water so as to allow the water to be harmless to the environment and can be used for other activities.

In general, wastewater on Tidung Island comes from households, health centers, local government offices and so on and on Tidung Island there is also a wastewater treatment plant (IPAL) so that the wastewater produced cannot pollute the environment on Tidung Island. The function of the wastewater treatment plant (WWTP) on Tidung Island, among others, is for processing wastewater into clean water where the wastewater will be subjected to a strict filtering process so that the wastewater becomes cleaner and does not harm the environment, to maintain the ecosystem and can be reused so that it can be reused. can reduce costs in the need to purchase clean water.



Fig. 5: Waste water treatment plant facilities at Tidung Besar Island

IV. CONCLUSION

Based on the results of the analysis and discussion of sustainable environmental studies for age-friendly cities on Tidung Island, it can be mapped as follows:

- Health services

A puskesmas building is available as a health service for the community.

The challenge going forward is that there is a need for a hospital building with complete medical equipment so that it can serve residents without the need for treatment outside Tidung Island.

- Education services

There are already school buildings from elementary to vocational education levels.

The challenge in the future is that buildings are needed for kindergarten, high school and university education levels and the need for complete library collections on Tidung Island.

- Open space

There are 2 (two) RPTRA locations and in general children and residents carry out activities (playing or sports) at the Love Bridge tourist spot, port area, TPU and in the field on the outskirts of residential areas.

The challenge in the future, it is necessary to provide a sports field, both indoor and outdoor.

- Pedestrians

Environmental road conditions in the form of paving block roads that have an uneven surface so that it can be dangerous for the elderly and children.

The challenge in the future is that the paving block road needs to be trimmed so that the surface is not bumpy so that it is safe for the elderly and children.

- The shape and mass of the building

In general, they still use a squat closet and there are no handles around it, making it difficult for the elderly to do activities in the bathroom and there are still stairs that are too high and the slope of the stairs is not sloping, making it difficult for the elderly and toddlers to use this access.

The future challenge is that there is a need for socialization to residents about the requirements for age-

friendly settlements and funding assistance from the government is needed to realize age-friendly settlements.

- Transportation service

Generally, residents use 2-wheeled motorized vehicles or bicycles to support activities in the city and bentor vehicles are only used for tourism purposes.

Future challenges, bentor vehicles are needed to support the activities of the elderly traveling in the city.

- Availability of clean water

The availability of clean water is only sufficient to serve 70% of the population of Tidung Island.

The challenge in the future is to improve the provision of clean water for the residents of Tidung Island so that all residents can be served in their needs for clean water.

- Availability of electrical energy

The availability of electricity on Tidung Island only relies on electricity supply via submarine cables from the Teluk Naga Substation, Tangerang.

The challenge in the future is that an alternative to the availability of electrical energy on Tidung Island is needed.

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