

The Development of Historical and Eco-Tourism District of Setu Babakan in South Jakarta, Indonesia: Ecodistrict Planning Approach

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Abstract. On the development of tourism within a settlement, its sustainability depends on how to make the lowest possible environment impact and provide long-term economic and social benefits to local communities. This paper describes the results of analysis on a settlement where the tourism activities developed in it. The principal of eco-district was the main theory used in the analysis in order to accelerate district-scale sustainability. Eco-district is the principle of urban planning that aims to integrate the objectives of sustainable development and reduce the ecological impact of the development. The case study was located in Setu Babakan, a lakeside and a historical tourism district in South Jakarta, Indonesia. The focus of the study was on the physical condition of the open spaces and activities inside them. In some tourism destination areas, many of the attractions took place in open spaces. The results of the evaluation were several recommendations for the development concept of open spaces in the historical and ecotourism district of Setu Babakan which hopefully will guarantee it's sustainability in the future.

Keywords: eco-district planning, ecotourism, evaluation, historical district

1. Introduction

The area of the lakeside has its own appeal, so as this area is often used as a tourist spot or as a place for recreation and socialization. The appeal is even greater if the location of the lake is located in the inner city area that has been very densely built, due to two major driving factors. The first factor is its appealing natural condition, contrary to the crowded city condition. The second factor is accessibility where the location relatively easy to reach by the people who live in the city.

Tourism activities that develop around the lake will certainly have an impact on the lake and the surrounding area. One such impact is the transformation of the physical, social and cultural environments around the lake due to tourism activities. The transformation can have positive or negative impacts. When the transformation leads to the type of change that has a positive value for tourism activities, then it will be able to support the sustainability of the area as a tourist area. Positive transformation can occur in the form of the improvement in physical quality through the provision of infrastructure facilities that can support tourism activities, as well as the improvement of the social and economic quality of the community with the opportunity to open small business in their homes or the employment opportunities in tourism business. Nevertheless, the impacts are often in the form of negative transformations such as the degradation of physical environment due to waste pollution and



the increased of traffic load that also lead to infrastructure damage, the marginalization of local communities, acculturation of local culture and other negative impacts.

One of the lake tourism areas in Jakarta is located in Setu Babakan. Setu Babakan is a cultural heritage area located in Srengseng Sawah, Jagakarsa Subdistrict, South Jakarta. The plan to establish Setu Babakan as a Betawi Cultural Heritage area began in 1996, however, an official decision only then appeared in 2000 with the issuance of Governor's Decree no. 9 in 2000. The Betawi Cultural Heritage of Setu Babakan was inaugurated in 2004 after going through various preparation processes. The presence of the lake also become one of the attractions sold by the manager Setu Babakan in addition to other main tourist attractions directly related to Betawi culture such as the local tradition, art activities, traditional houses etc.

Tourism activities are closely related to open space. Open space can attract tourists and become the main place for recreational activities. Based on the observations, the majority of recreational activities in tourism areas are taking place in open spaces than in enclosed spaces. Therefore, the increase of tourism activities in one area will lead to an increase in the need for the availability of open space as a place to accommodate those tourism activities. Tourism activities related to the lake and cultural tourism activities in Setu Babakan take more places in the open spaces of this area.

This paper will describe the results of analysis on the settlement of Setu Babakan. The principal of eco-district was the main theory used in the analysis in order to accelerate district-scale sustainability. Eco-district is the principle of urban planning that aims to integrate the objectives of sustainable development and reduce the ecological impact of the development. The focus of the study was on the physical condition of the open spaces and activities inside them. The results of the evaluation were several recommendations for the development concept of open spaces in the historical and ecotourism district of Setu Babakan which hopefully will guarantee it's sustainability in the future.

2. Eco-district Principles

Eco-district is the principle of urban planning that aims to integrate the objectives of sustainable development and reduce the ecological impact of the development. According to PoSI as stated by Seltzer [1], Eco-districts are characterized by values of diversity and participation, equity in decision making and investment, health and well-being of the community, positive environmental impacts, and conservation and stewardship. There are 7 (seven) sustainability performance goals of eco-districts:

1. Community Vitality – Healthy, equitable, and vital communities with active and diverse participation
2. Air Quality and Carbon – Beyond carbon neutrality and healthy air quality
3. Energy – Net-zero energy usage annually
4. Access and Mobility – Healthy, clean, and affordable transportation options
5. Water – Water, in all its forms, meets both natural and human needs
6. Habitat and Ecosystem Function – Integrate built and natural environments for healthy urban ecosystems
7. Materials Management – Zero waste and optimized material

The definitions put forward by some researchers and planners on Eco-district itself are quite diverse. In this research, the patterns of open space in the settlement becomes the main variable to evaluate the current condition based on the eco-district principles and then proposed a number of improvement recommendations in order to meet the principles. Therefore, the definition of eco-district to be used is the definition of Bennet mentioned by Brown [2]. In Brown [2], it is mentioned that this definition was produced by Bennet who developed the model of an ecologically sustainable district. This definition builds the framework for a comprehensive strategy to build communities with the lowest possible environmental impact and highest long-term economic and community returns [2].

According to Bennet in Brown [2], An Eco-District is a neighborhood that generates all its energy from on-site renewables, collects and recycles rainwater and waste, and prioritizes pedestrian, bike, and transit access. It combines mixed use, mixed-income development; neighborhood scale parks, schools, community centers; and services, and enhanced IT infrastructure. The objective of the

program is to test, accelerate and eventually codify the next generation of best practices in green development and civic infrastructure that can be scaled to create neighborhoods with the lowest environmental impact and highest economic and social resiliency [2].

By drawing a number of keywords from its definition, there are 6 (six) elements of a settlement pattern that can meet the criteria for ecologically sustainable districts:

1. On-site Renewable Resources
2. Rainwater & Waste Collection & Recycling
3. Pedestrian, Bicycle, & Transit Access
4. Mixed-Use & Mixed-Income Development
5. Neighborhood-scale Parks
6. Schools, Community Centers, & Services

To analyze the pattern of a district whether it meets the principle of eco-district or not, Brown [2] by improving the district pattern from Bennet has produced an eco-pattern district evaluation table as can be seen in the following table.

Table 1. Eco-pattern language

Ecodistrict Patterns	1	2	3	4	5	6
Walkable Community			X	X	X	X
Pedestrian Density			X	X	X	X
Web of Public Transportation			X	X		
Activity Nodes			X		X	
Green Streets		X	X		X	
Corner Grocery				X		
Parallel Roads			X			
Tangent Auto Roads			X	X		
Self-Sufficiency	X	X		X		X
Scattered Work				X		X
Zero Waste		X				
Energy Independence	X					
Water Neutral		X				
Urban Agriculture	X				X	X
Neighborhood Identity			X	X	X	X
Diverse Neighborhood				X	X	X
Manageable Scale			X	X	X	
Life Cycle		X		X	X	X
Building Fronts			X	X		
Individually Owned Shops				X		
Accessible Green		X			X	
Small Public Squares			X		X	
Neighborhood Boundary		X			X	
Main Gateway				X		X

Source: [2]

This table is adapted in the Setu Babakan study to evaluate the ecological level of the existing district pattern in the Setu Babakan area so that some recommendation can be proposed in the development of Setu Babakan as a neighborhoods with the lowest environmental impacts and highest economic and social resiliency.

3. Setu Babakan, South Jakarta

3.1. The Development Zones of Setu Babakan

This tourist destination of Kampung Budaya Betawi stands on a land area of 32 HA. Setu Babakan has great potential as a tourist attraction due to the presence of the lake within and it has a vast land that can be utilized for a variety of tourist activities.

Setu Babakan was divided into 4 (four) development zones. The four zones are zone A, B, C, and embryo zone. Of the 4 zones, zones A, B, and C have not been completed due to land ownership and development constraints. While embryo zones already can be visited by the public and usually crowded on weekends.

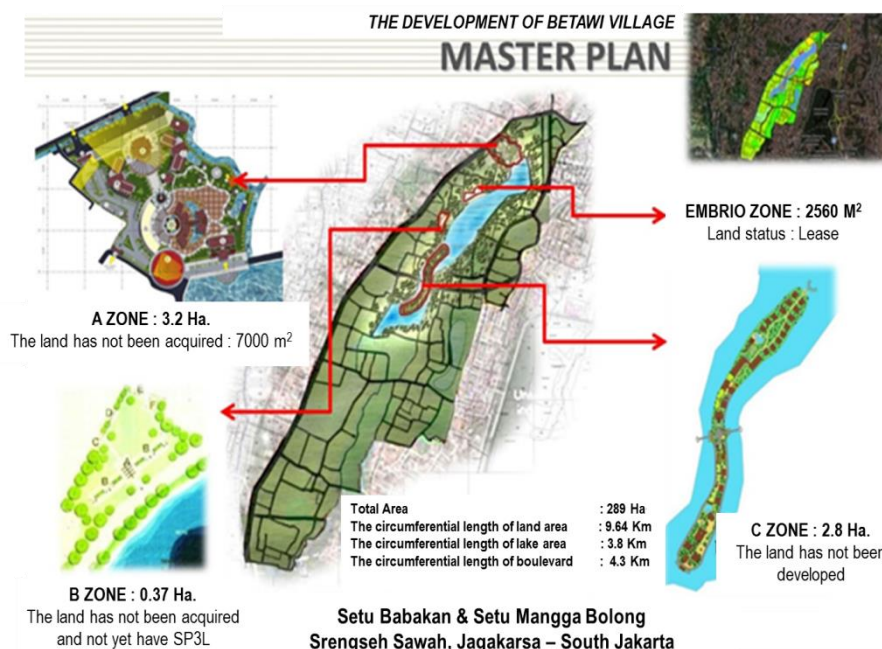


Figure 1. The Masterplan of Setu Babakan [3]

3.2. The Physical Condition of Open Spaces in Setu Babakan

From a village with an area of 289 hectares, 65 hectares of them are owned the government in which it is managed is only 32 hectares [4]. This settlement is inhabited by at least 3,000 families [4]. Most of the inhabitants are native Betawi people who have been hereditary living in the area. The rest are migrants, such as migrants from West Java, Central Java, Kalimantan and others who have lived more than 30 years in this area [4].

In the study area, there are some green open spaces with fairly clean and well-maintained condition as these open spaces also become the main destination for tourists visiting Setu Babakan. These open spaces have some functions that can be commonly used by tourists. However, in terms of quantities there are some decreases in the areas of open spaces around Setu Babakan. This transformation was driven more by an increase in the need for a place to live rather than to accommodate tourism facilities.

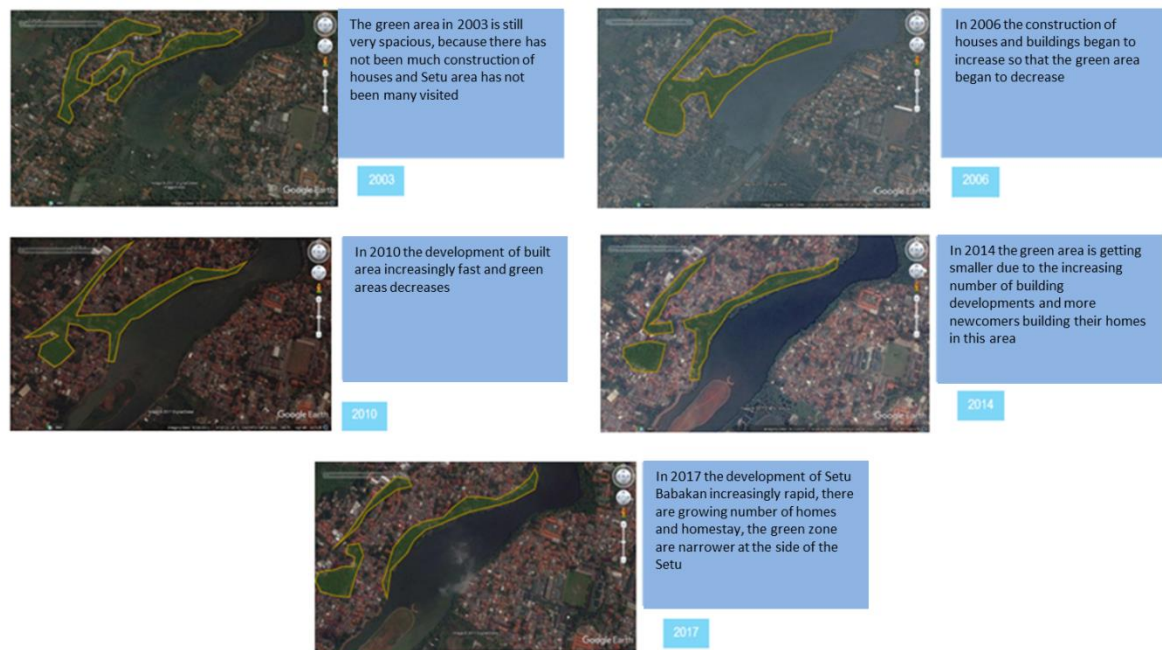


Figure 2. The Transformation of the Areas of Open Spaces in one of The Zone
Source: modification from Pratiwi [5]

Based on its function there are two types of open space: active open space and passive open space. The active open spaces within the area are mostly located in the Embryo area and used as the venue for some art performances. Meanwhile, passive open spaces mostly are in the form of parks and green paths. Open spaces in the Embryo area are also often used by tourists who visit Setu Babakan just for picnics or family gathering because the atmosphere in this place tends to be cooler than other areas in Setu Babakan and the area is quite extensive and there are many traders selling foods in this area. Besides being used by tourists, open spaces in the Embryo area are also used for daily activities by local people, such as to gather, hold meetings and as a place for children to play.

Aside from the Embryo area, there are also other active open spaces in Setu Babakan namely Warung Riung & Soban '22 which is a fairly wide open area with a number of nearby merchant kiosks and also there are some children playgrounds that can be visited by the public. Similar to the Embryo area, the presence of lush trees have made the atmosphere of the area of Warung Riung shady and cool, so that visitors pretty much stop to this place.

The other active open space is in the form of fish pond or called empang. Empangs are generally located behind the houses or stalls. Empang is one of the income sources of the Setu Babakan community. The embankment of the empang mainly planted with plants such as banana trees.

Green open spaces alongside of the lake have been equipped with trash cans, garden lights, and pedestrian pathway. The pedestrian pathway has a width of approximately 1.5 meters and paved with conblock material. On the side along the pedestrian pathway there is a vehicle lane that also paved with the same material as pedestrian pathway. This vehicle lane is also extensively used by pedestrians to circulate. Meanwhile, the pedestrian pathway is more widely used as a place to sit and eat, and equipped with benches and tables.

In the nearest area there is Setu Mangga Bolong which is still in one management unit with Setu Babakan. In contrast to the Setu Babakan, Setu Mangga Bolong area is not as much visited as in Setu Babakan and mostly used as a fishing spot.



Figure 3. The Condition of Open Spaces in One of The Zone of Setu Babakan[5]

4. The Evaluation of Open Spaces in Setu Babakan based on the Principles of Eco-district

The evaluation of open spaces in Setu Babakan was conducted based on eco-district principles put forward by Bennet (2009) and by using the table to evaluate district patterns generated by Bennet (2009) and Brown (2009). The following table shows the evaluation results.

Table 2. Evaluation of Open Spaces in Setu Babakan

The Principles of Ecodistrict		The Evaluation of Open Spaces in Setu Babakan			
	Y		N		Description
	1	2	3	4	
Walkable Community Encourage walking as a primary mode of transportation by creating an environment that is not only safe, but also easy an interesting for pedestrians to use. (Brown and Dykema, 2009)				X	The local streets of settlement around the lake are often used by visitor vehicles to enter and/or off the lake area which led to an increase of the vehicle load on those narrow local streets. Meanwhile, the Irregular circulation patterns as well as several dead-end streets in the settlement also make it difficult for visitors to be oriented in the district.
Pedestrian Density For public squares, courts, pedestrian streets, any places where crowds are drawn together, estimate the mean number of people in the place at any given moment (P), and make the area of the place between 150P and 300P square feet. (Alexander in Brown and Dykema, 2009)			X		There is a very significant difference in the density of pedestrians between weekdays and weekends/holidays. Pedestrian density also concentrated in embryo zones.
Web of Public Transportation The system of public transportation can only work if all the parts are well connected. (Alexander in Brown and Dykema, 2009)			X		The nearest road that is served by public transportation is Jl. Mohamad Kahfi II. Near one of the main entrance gates, the gate of Si Pitung, there is a public transport stop: Setu Babakan’s Halte. The lake of Babakan itself is located inside the local settlement and has a distance of about 400 meters from the gate of Si Pitung.
Activity Nodes Create nodes of activity throughout the community, spread about 300 yards apart. (Alexander in Brown and Dykema, 2009)			X		The lake, the promenade along the lakeside, the performance stage, are some potential activity nodes that still need to be improved especially in zones other than embryo zones. At present, the activity nodes are more concentrated in the embrvo zone. In addition,

The Principles of Ecodistrict	The Evaluation of Setu Babakan			
	Y		N	
	1	2	3	4
				Description
				although Setu Mangga Bolong is still included in the same management area as Setu Babakan, this area seems to be cut off and there is no continuity of development activities with Setu Babakan area.
Green Streets Avoid the use of hot hard asphalt, especially for local roads. On local roads, put in more paving stones, gravel or grass blocks to form a surface for the wheels of the cars. (Alexander in Brown and Dykema, 2009)		X		Alongside of the lake has been provided promenade with paving block material that can still absorb rain water into the soil. In addition, shade trees also planted on along this side. Other than that, local streets in the settlement are still using asphalt.
Corner Grocery Give every neighborhood at least one corner grocery, somewhere near its heart. Place them on corners, where large numbers of people are going past. (Alexander in Brown and Dykema, 2009)		X		Minimarkets can be easily found on the side of the main road, while in the settlement around the lake, there are quite a lot of houses that open small shops so that residents can easily buy daily necessities. Tourism activities also increase the number of residents who open food and souvenir stalls in front of their houses especially those facing the promenade along the lakeside.
Parallel Roads Keep parallel roads at least 100 yards apart (to make room for neighborhoods between them) and no more than 300 or 400 yards apart. (Alexander in Brown and Dykema, 2009)		X		The main entrance road to the Setu Babakan area which are parallel between one another are Jl. Mohamad Kahfi II and Jl. Srengseng Sawah.
Self-Sufficiency A self-sufficient community is a sustainable one. Encourage a balanced mix of land uses that can accommodate industry, commerce, farming and housing by providing a diverse and integrated network of zoning laws. (Brown and Dykema, 2009)			X	Relies heavily on the presence of outside visitors. The main performance stage on the region still stands on private land (not yet released by local government). There is a mix of residential, commercial and retail, but still need to be intensified.
Scattered Work Prohibit large concentrations of work, without family life around them. Prohibit large concentrations of family life, without workplaces around them. (Alexander in Brown and Dykema, 2009)		X		There is a mix of residential, commercial and retail, but still need to be intensified.
Zero Waste Treat all waste onsite with biological systems. Reclaim as much water as possible for non-potable uses and harvest biomass for use as fertilizer on local farms. Collect sewage sludge, kitchen waste and yard waste and convert it into gas for energy. (Brown and Dykema, 2009)			X	There is no strategy related to the recycling of waste in the area. The handling of waste done only on the sorting between organic, an-organic and B3 kinds of waste.
Energy Independence Minimize dependence on a greater municipal grid for the energy needs of the community. Take advantage of onsite renewable resources such as solar, hydro, geothermal and wind power to generate the energy required to make the district operate. (Brown and Dykema, 2009)			X	Energy needs are still highly dependent on PLN (state-owned electricity company)
Water Neutral Minimize dependence on a greater municipal grid for the water needs of the community. Collect rainwater and treat blackwater onsite using biological systems. (Brown and Dykema, 2009)			X	There is no water-related strategy within the region yet. Formerly, lake water can be used by local residents, but because the water condition of the lake is now polluted then it is no longer used by the residents for their daily needs. The majority of residents still take water from the ground (pump wells) and there is no

The Principles of Ecodistrict	The Evaluation of Setu Babakan			
	Y		N	
	1	2	3	4
	Description			
	waste water recycling efforts.			
Urban Agriculture Encourage the community to support local farmers and grocers by providing them with tax credits so that their prices are competitive. (Brown and Dykema, 2009)	X		Residents are still conducting the old tradition where on the yard of their houses they plant productive trees. The local government also planted productive trees in the development program of this Betawi cultural heritage tourism area.	
Neighborhood Identity People need an identifiable spatial unit to belong to. Help people to define the neighborhoods they live in. (Alexander in Brown and Dykema, 2009)	X		Strong historical and cultural identity of the neighborhood close to the heart area of tourism. But only several houses located deep inside the settlement area are applying Betawi architecture elements especially for the façade.	
Diverse Neighborhood The homogeneous and undifferentiated character of modern cities kills all variety of life styles and arrests the growth of individual character. Do everything possible to enrich the cultures and subcultures of the city. (Alexander in Brown and Dykema, 2009)	X		Diverse community in terms of their level of economic ability, and ethnicity / religion. There have been many non-Betawi residents who have been residing in the area.	
Manageable Scale Give each community the power to initiate, decide, and execute the affairs that concern it closely: land use, housing, maintenance, streets, parks, police, schooling, welfare, neighborhood services. (Alexander in Brown and Dykema, 2009)	X		The preservation of Betawi culture in the Setu Babakan district involves the local community. Festivals and performances are performed alternately by residents from various RT and RW.	
Life Cycle Make certain that the full cycle of life is represented and balanced in each community. (Alexander in Brown and Dykema, 2009)			X	Facilities for resident's life cycle that already exist are: school (kindergarten, elementary, junior high, high school), university, business, and cemetery. Need more upgraded with facilities that do not yet exist: nursing home, barrier free environment etc. There is a plan for the development of a Child-Friendly Integrated Public Space with an area of 6000 m ² .
Building Fronts Building set-backs from the street, have actually helped greatly to destroy the street as a social space. Build right up to the paths. (Alexander in Brown and Dykema, 2009)	X		Most of the buildings are facing toward the lake. However, there is a potential for the occurrence of the street without facades on the side of the lake due to several lands fortify their peripheries adjacent to the promenade alongside of the lake. Originally, the local streets in the area were still in the form of soil paths that were later widened (the residents alongside the streets donated some of their lands for street expansion). Some of the houses whose land has been cut off for the expansion of the street then change their orientation towards this local street.	
Individually Owned Shops When shops are too large, or controlled by absentee owners, they become plastic, bland, and abstract. Encourage the development of individually owned shops. (Alexander in Brown and Dykema, 2009)	X		Stalls and small retail stores are the foundation of the livelihood / economy of the district.	
Accessible Green People need green open places to go to. Build one open public green within three minutes' walk—about 750 feet—of every house and workplace. (Alexander in Brown and Dykema, 2009)	X		There is no tariff to enter the area (free of charge). Visitors who bring a vehicle are only required to pay for parking tickets for the vehicles.	
Small Public Squares Make a public square much smaller than you	X		Promenade along the side of the lake is a public social space which can be accessed by anyone.	

The Principles of Ecodistrict	The Evaluation of Setu Babakan				Description
	Y		N		
	1	2	3	4	
would at first imagine; usually no more than 45 to 60 feet across, never more than 70 feet across. (Alexander in Brown and Dykema, 2009)					
Neighborhood Boundary The strength of the boundary is essential to a neighborhood. If the boundary is too weak the neighborhood will not be able to maintain its own identifiable character. (Alexander in Brown and Dykema, 2009)			X		The main gates and houses with strong Betawian identity near the entrance area create a strong perceptual boundary of this Betawi Cultural Heritage area.
Main Gateway Mark every boundary in the city which has important human meaning— the boundary of a building cluster, a neighborhood, a precinct— by great gateways where the major entering paths cross the boundary. (Alexander in Brown and Dykema, 2009)			X		There are three entrance gates scattered in the arterial road of Setu Babakan area.
Notes: 1 = appropriate 2 = slightly appropriate 3 = slightly un-appropriate 4 = un-appropriate					

Based on the table above, it can be concluded that the district patterns that have met the ecological criterias but still need some improvements are: (1) green street, (2) corner grocery, (3) parallel roads, (4) scattered works, (5) urban agriculture, (6) neighborhood identity, (7) diverse neighborhood, (8) manageable scale, (9) building fronts, (10) individually owned shops, (11) accessible green, (12) small public squares, (13) neighborhood boundary, and (14) main gateway. Setu Babakan area already equipped with several infrastructures and facilities to support the activities of tourism and living. Local community participation in the activities of tourism also becomes another added value for its social resiliency as a settlement and as a tourism area.

Meanwhile, the ecological patterns that have not existed in Setu Babakan area and need to be a priority are: (1) walkable community, (2) pedestrian density, (3) web of public transportation, (4) activity nodes, (5) self-sufficiency, (6) zero waste, (7) energy independence, (8) water neutral, and (9) life cycle. Connectivity and integration of existing infrastructure become main aspects that have been missing in Setu Babakan area. Inclusivity becomes another main issue due to the lack of facilities especially for disable and elderly. The last issue is related to the sustainability of the area: economic and environmental sustainability.

5. The Recommendation for The Development of Setu Babakan Eco-district

Potential development of Setu Babakan Ecotourism can be formulated based on the evaluation result above. More than a half of eco-district pattern criteria from Bennet (2009) and Brown (2009) have been met in the current Setu Babakan area. Thus, it can be concluded that the Setu Babakan area has the potential to be further developed as an eco-district tourism area. Recommendations are divided into two types: recommendations for the improvement of existing eco-district patterns as well as the recommendations to develop the eco-district patterns that do not yet exist.

On the existing eco-district patterns, improvements can be made primarily by improving the quality of the tourist route from the main gateway to the lake area as well as the green pathways connecting all open/green spaces and public open spaces in the Setu Babakan area. The improvements of tourist routes are not only by improving the quality of the pavement but also by improving the comfort and environmental attraction around those routes. The Increased comfort of tourist route is realized through the provision of shade trees, seating and resting area at a number of points and the separation

between the vehicle circulation and the pedestrian circulation. Pedestrian circulation should be a top priority within the district. Meanwhile, the increased attractiveness of the environment around the tourist route is realized through the increased maintenance level of buildings and open spaces especially those passed by the visitors along the tourist route.

Meanwhile, the followings are recommendations in a number of district patterns from Setu Babakan that have not yet ecological and should be a priority for the development.

5.1. Walkable Community

The concept of walkable community in Setu Babakan area can be presented by the functioning of pedestrian and promenade path alongside of the lake purely as the area for pedestrian to circulate. In some parts of the area, especially near the entrance area, it is necessary to provide adequate parking spaces so that cross-circulation does not occur between pedestrians and vehicles as happened in the current conditions. In addition, to make pedestrian circulation as the main mode of circulation in the district, there should be a provision of safe, easy and attractive pedestrian environments. Houses and other buildings should be directed toward pedestrian paths, the quality of pavements for the pedestrian path as well as for the vehicle street should be improved and from these paths, there should be a possibility to view towards attractive sights.

5.2. Pedestrian density

Spread some points of activity to attract visitors throughout the development zone in Setu Babakan region so that the densities of visitors are not concentrated in one zone only. This concept is reinforced by the provision of a convenient pedestrian link network that connects the entire zones.

5.3. Web of public transportation

Provide a convenient place for public transportation transit. Provide additional facilities to increase comfort such as adequate seating with good conditions and durable materials, a place that appeals to children so they can play while waiting for public transport such as providing swing seats for children.

5.4. Activity nodes

The development and management of all Zones in Setu Babakan district: Embryo zone, A, B, and C zones need to be done equally and not focusing on one zone only. The development of Setu Mangga Bolong area needs to be improved and provide a continuous path of tourism activities between Setu Babakan with Setu Mangga Bolong. For circulation, the circulation of visitor's vehicles should be limited to the main routes of the area designated by the district's manager. This restriction is aimed to make the circulation of visitor's vehicles not penetrate the local residential streets. Thus the tourist activities will not disturb the comfort of the local residents who lived around Setu Babakan.

5.5. Self sufficiency

Increase diverse land uses that can accommodate several functions such as industrial, commercial, agricultural/ plantation and residential areas. Household small industries that do not pollute, especially to the lake water, can be integrated into the land use of Setu Babakan area. The types of small industries developed are those that can support tourism activities within the Setu Babakan district such as the Betawi food production and handicraft industries.

5.6. Zero waste

The handling of waste in Setu Babakan area should not stop only at the separation between dry waste, wet waste, and B3 waste. But it needs to continue until the recycling process so as to minimize the waste generated out of this area. There have been several examples on the application of zero waste concepts in some settlements in Indonesia. For example the settlement of Banjarsari, Cilandak Barat, in South of Jakarta. The same concept can be applied to Setu Babakan area in order to achieve

environmental sustainability, and the concept can also generate additional sources of income for local residents.

5.7. Energy independence

Energy independence in Setu Babakan region can be achieved through the utilization of solar energy panels. In addition, solar energy lights can be installed in the promenade area along the lakeside and along other circulation pathways.

5.8. Water neutral

Water conservation within Setu Babakan area can be achieved through the efficient use of water as well as rainwater storage and the recycling of grey water for bathroom flushing and garden watering. In open spaces that are either public open spaces or on the private yard of the houses, absorbing wells need to be applied to increase water absorption into the soil. In addition, to maintain ground water quality, it is necessary to control groundwater retrieval. Groundwater taken from deep wells must be prevented. Utilization of government water supply network (PDAM) needs to be improved and with water quality that needs to be maintained so that people are interested to use it.

5.9. Lifecycle

Residential environments that are responsive to the occupant's life cycle are those whose physical condition and facilities available in it support the development of the place as a safe and comfortable living place for its inhabitants from birth to death. In Setu Babakan, this concept can be realized through the implementation of barrier-free design of open spaces for disabled and elderly.

Through all of the above recommendations, whether for improving existing conditions or meeting the criteria of ecological district patterns, Setu Babakan is expected to become a sustainable cultural tourism area with the lowest environmental impact and highest economic and social resiliency.

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