

Environmental Attributes Review of Muara Angke Fish Market and Auction, Jakarta, Indonesia

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ABSTRACT

Environmental attributes as a design quality assessment material have been put forward since 1980. Muara Angke Fish Market and Auction is the largest fish auction facility in Indonesia. Its development has received attention from the community for a long time. This article intends to examine the quality of the Muara Angke design by using environmental attributes proposed by Weisman in 1980. The study was conducted by first determining the attributes to be used, namely activity, accessibility, and sociality. The research method is descriptive qualitative by examining these three aspects at Muara Angke Fish Market and Auction. Market facilities and fish auction in Muara Angke are considered feasible in terms of activities and sociality. However, accessibility needs to be improved. The combination of one-door access and linear circulation is suitable to reach all points, but the absence of distribution of circulation paths between sellers, buyers, and goods makes the main route congested, especially in the active phase of the market, namely at night.

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1. Introduction

The relationship between human behavior and architecture has been discussed since 50 years ago [1][2]. The concept of the relationship between behavior and architecture is commonly known as environmental behavior study or environmental psychology. The environmental behavior study varies widely from the conceptual stage to the model of the relationship between the two factors. The purpose of environmental behavior study depends on the character of the place and the character of the user.

In a behavior study environment, the design has several attributes related to individual, social, physical, and cultural aspects. Windley and Scheidt in Haider and Kaplan [3] reveal 11 attributes that can be used as material for assessing the design of a place from the

perspective of environment behavior study. These attributes include sensory stimulation, legibility, comfort, privacy, adaptability, control, sociality, accessibility, density, meaning, and quality.

Design assessments based on the attributes proposed by Windley and Scheidt (1980) have been carried out in several places. Haider and Kaplan [3] conducted a study on the suitability of open space for young people using environmental attributes proposed by Windley and Scheidt. The results show that of the 11 attributes, five are considered suitable as a basis for assessing open space for young people. Another study was conducted by Devy (2009), who examined the use of market space using 11 environmental attributes. Based on the analysis, it was found that Pasar Bulu Semarang, the object of the study, experienced crowdedness based on the assessment of adaptability,

sensory stimulation, accessibility, privacy, sociality, and meaning.

Market is the most basic form of a place that facilitates buying and selling activities. Market is a very important economic sector for the majority of the population in Indonesia. Fish markets and fish auctions are one of the unique forms of Indonesian markets because of the geographical conditions of the nation. The market and fish auction is considered capable of increasing market utility, such as increasing the economy, productivity, and added value of fishery products and developing marine and fisheries business in Indonesia.

One strategy to restore a declining perspective on the market is to study spatial market planning and fish auctions. Spatial planning includes physical and non-physical aspects. The effectiveness and suitability of the market layout and fish auction can be done using the environment behavior study instrument, namely the design attributes mentioned earlier. Therefore, the design attribute assessment is considered capable of answering the user's physical and non-physical needs problems.

This paper intends to discuss the assessment of Muara Angke Fish Market and Auction using the attributes proposed by Windley and Scheidt. Muara Angke was chosen as a case study because it is the largest fish processing facility in Indonesia [4].

2. Methods

This research uses descriptive qualitative methods. There are two steps that need to be taken in this research. The first step is to determine the attributes that will be used in the research. The discussion will focus on the selected attributes rather than using all the attributes to analyze the place. The same is done by Heider & Kaplan [3]. The next step is to analyze the environmental quality of Muara Angke Fish Market & Auction based on the

selected attributes. The analysis will be described in a narrative manner based on observations and related literature.

Environmental Attributes

This research uses the theoretical basis of a behavioral approach to the dialectic linkages between space and humans and society or its inhabitants. This approach looks at the aspects of norms, culture, psychology, and different societies will produce a different concept and form of space [5].

The environmental attribute is the quality of the environment that is perceived by humans as an experience of the physical [3]. The design attributes expressed by Windley & Scheidt are considered appropriate as a material for evaluating the quality of a place. Weismann explained these attributes again and completed them from 11 to 12 attributes. The newest attributes are explained by Christenson [10] to review facilities for aging people. The difference between those attributes is explained in table 1.

Table 1: Comparison of Environmental Attributes

Windley & Scheidt (1980)	Weisman (1981)	Christenson (1990)
Sensory stimulation	Sensory stimulation	Sensory stimulation
Comfort	Comfort	Comfort
Accessibility	Accessibility	Accessibility
Legibility	Legibility	Legibility
Density	Crowdedness	Security
Privacy	Privacy	Privacy
Adaptability	Adaptability	Adaptability
Meaning	Meaning	Meaning
Quality	Activity	Personalization
Control	Control	Territoriality
Sociality	Sociality	Socialization
	Visibility	Aesthetic

Source: (Author, 2020)

This study will not use all of these aspects. The easiest aspect to observe is activity. Activities represent attributes related to the user of the place. Another attribute that will be discussed

is accessibility. Accessibility represents attributes related to the physical place or environment. Then the attribute that represents the behavioral factor is sociality. Analysis of environmental attributes at Muara Angke Fish Market and Auction will use the three attributes described below.

1. Activities are behaviors that occur continuously in an environment [5]. Meanwhile, Setiawan [2] emphasizes the importance of the time period for defining activities.
2. Sociality assesses the form of relationships between one person and another in an environment [5]. Sociality can also be seen as the ability of a place to accommodate social interactions [3].
3. Accessibility is described as the ease with which users can move in a room or place. Accessibility can be assessed from a visual and physical perspective. Physical accessibility is indicated by circulation, while visual accessibility can be in the form of access.

Muara Angke Fish Market and Auction (MAFMA)

Muara Angke Fish Market and Auction is located in the Muara Angke delta, Pluit Village, Penjaringan District, North Jakarta Municipality. Its location on the north coast of Java Island makes Muara Angke the right location for fishing boats to anchor and drop their catch. The Muara Angke area does not have only a fish market and auction, but also a fishing settlement, a fish drying industry, and culinary delights. However, Muara Angke faces various problems, from flooding to overcrowding. Even people have minimal access to cleaning facilities such as trash cans. Throughout the observation, there was not a single trash can prepared by the Sanitation Office along the road to Kali Adem Harbor.

Muara Angke Market and Auction is a wholesale market that serves large sales. However, in the field, there are also retailers whose positions are outside MAFMA. Sellers in the MAFMA serve mostly wholesalers but occasionally serve retail sales. The Fish Auction Site is separate from the market building. The description of the location of the fish market and auction can be seen in Figure 1.



Source: (edited from Google Earth, 2016)
Figure 1 : Location of Muara Angke Fish Market and Muara Angke Fish Auction

3. Results and Discussions

3.1. Activity

Observation of activities includes behavior in an environment that is done by someone within a specific time. Activity analysis will explain in general the activities that occur at MAFMA. Activity analysis is divided into two types, namely activities that take a long time, and activities that tend to be done quickly or only briefly. This study's results were obtained from data sources, namely from the observations of researchers on the object of research at Muara Angke Fish Auction.

MAFMA becomes active at 17.00 local time. The active phase lasts from 17.00 until dawn.

The continuation of this active phase depends on fishing boats which dock from 17.00 to 05.00. At that time, the fish are unloaded and moved from the dock area to the fish auction site and then sold on the market or transported to sellers' locations outside the market.

The auction is open 24 hours, especially Saturday to Monday. The auction's passive phase is characterized by the active activity of several sellers in the auction. However, it appears that the fish sold in the passive phase is not as fresh as fish during the active phase.



Source: (travel.kompas.com [9])
Figure 2 Muara Angke Market at night

3.1.1. Rapid Activity

Rapid activity in this analysis is in the form of an activity or work in an inhabited environment. This fast activity occurs at the research location in the form of work that is only done briefly and does not take up space permanently. The rapid activity took place in the market and auction areas. Activities that occur in the market include buying and selling transactions and taking fish stocks from the auction to the market.

Meanwhile, in the auction area, the auction process is relatively fast. The reason is that fresh fish must be distributed immediately, and the quantity of fish auctioned is quite large. The movement of goods at the auction site is relatively faster than in the market. The reason may be that the auction is intended for special

groups, such as market sellers or intermediaries. Buyers at an auction are buyers in bulk or wholesale.



Source: (republika.co.id [8])
Figure 3 Muara Angke Market at noon

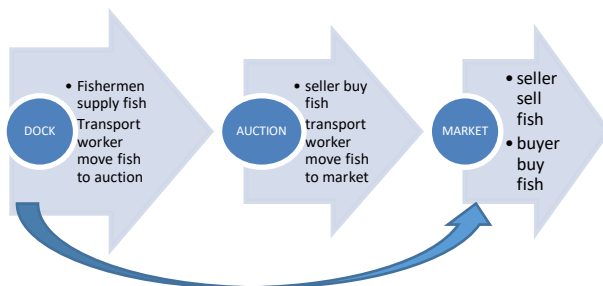
3.1.2. Long Activity

In this observation, the long activity is an activity that leads to routine work that uses space permanently or continuously. Long activities at MAFMA include selling or marketing fish and sorting fish by size or quality. Seller in auction do not offer to clean fish. This consideration is based on the nature of the auction, which is a wholesale market. Fish cleaning and cutting will take a long time because the fish purchased are many. In contrast, the market offers this service because they sell fewer quantity of fish.

Fish sorting activities are a long one because the fish obtained by sellers from the auction or directly from fishermen are sorted in the auction or in the area nearby port. One type of fish can be divided into two or three types based on size or quality. This is different from activities in other fish markets because MAFMA serves more wholesalers than retail. Fish of different sizes will be sold at different prices per kilogram.

3.2. Sociality

Sociality analyzes the form of interaction that occurs in MAFMA or the ability of MAFMA to accommodate social interactions. Sociality analysis is seen from each type of user. MAFMA users include fishermen, market sellers, transport workers, and buyers. The form of interaction between users is described in the following diagram.



Source : (Author, 2020)

Figure 4: Interaction between users at MAFMA

3.2.1. Fishermen

Muara Angke is home to 28,000 fishermen. Fishermen in Muara Angke come from various areas, including Indramayu, Tegal, Lampung, Aceh, and Cirebon [6] Fishermen in Muara Angke live in fishermen settlements in Muara Angke. Most dwellings have become their property even though most of the population is not the Betawi tribe [6].

Muara Angke fishermen dock at dusk until dawn. After anchoring, the caught fish will be received and transferred by the transport workers to the auction area. After the fish are unloaded from the ship, they are sorted based on their quality and type before being brought to the auction site. This sorting process took quite a long time, making the port quite busy when fishermen docked.

3.2.2. Seller

There are around 200 sellers at MAFMA. All sellers depend on their merchandise from fish they get from fishermen. The fish supply in

MAFMA is purely from fishermen's catch in Muara Angke. Because of this close relationship, some fishermen are also sellers. Sellers adjust to the active and passive phases of MAFMA. Usually, sellers who decide to open for up to 24 hours take turns with colleagues in guarding the shop. There is a close social relationship between sellers. Sellers also buy stocks through fish auction or directly from fishermen. The purpose of the fish auction is to increase the selling power of fishermen [7].

3.2.3. Transport Worker

The number of transport workers recorded in Muara Angke is approximately 150 people. These workers are very dependent on the fish caught by the fishermen. If the catch is small, then the income of transport workers is also small. The existence of transport workers at MAFMA is unique because it does not occur in other fish markets. Transport workers in other fish markets do not have the same role as transport workers in MAFMA. Also, these transport workers live in the Muara Angke settlement.



Source: (Author, 2016)

Figure 5: transport worker at Muara Angke

Fish production in Muara Angke is so large that it creates new types of jobs. The Muara Angke auction site, which was built in 2005, can accommodate 97 tons of fish per hour [7]. Some things that can be improved from the Muara Angke Fish Auction include the sorting, speed, and responsiveness of transport workers [7].

Another reason for the existence of transport worker is the distance between port and auction or market. Therefore the need for transport worker arise.

3.2.4. Buyer

Fish buyers at the fish market choose to shop at Muara Angke because the fish they get is fresh. The price of fish at Muara Angke Fish Market is also relatively lower, especially for wholesale buyers. Fish buyers in the market can be divided into 2, namely wholesale buyers and retail buyers. Muara Angke Market itself is designated as a Wholesale Market, but it still serves retail purchases in kilograms. Wholesale buyers can access the wholesale market or auction area. Meanwhile, retail buyers usually only access the market because it is impossible to buy retail at auction. Both the market and the auction open 24 hours but they operate accordingly with fish as the main commodity. Fish in the auction sold faster than fish in the market.

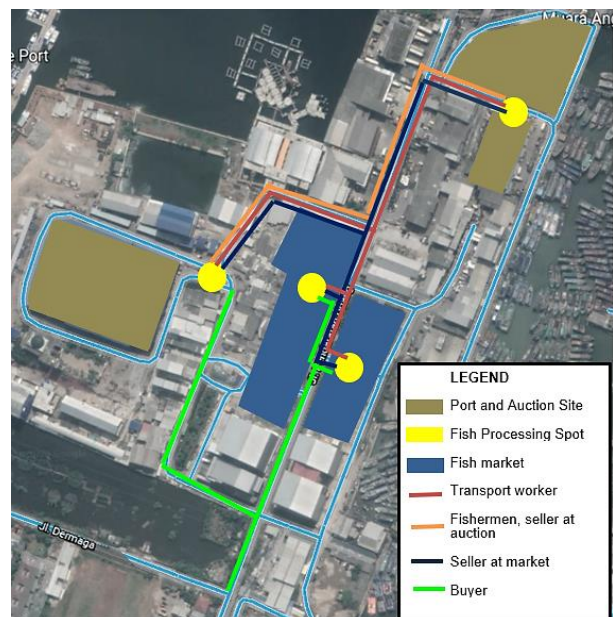
3.3. Accessibility

Accessibility is the ease of moving in an environment. The ease in question refers to the relationship between circulation and visuals. The accessibility analysis will look at the path of motion of MAFMA users. Accessibility must consider the ease of reaching all points, the suitability of functions with access, and the clear division between the circulation of each type of user.

Based on the layout, achieving all points at MAFMA is relatively easy. All visitors enter from one direction, namely the south. The MAFMA circulation system is divided into two main roads. One road headed for the auction site, and the other headed for the market. Then the circulation met at a point and continue toward the port. The end of this system is a point where fishermen unload fish. This pathway is very useful for different types of users. The north part reserved for those who

work directly with fish as trade goods. While buyers considered outsiders has access only in the south part of the circulation.

However, during the active phase, the transfer of goods will be more difficult due to the branch of circulation headed for the market and auction. The north part of the circulation becomes crowded during the active phase. The traffic becomes heavier when fish need to be transported to the outside area. When that happens, the circulation of buyers mixes with the circulation of fish. This situation is not ideal for a public building, especially market.



Source: (author, 2020)

Figure 6 Accessibility on Muara Angke Fish Market and Auction

The fish distribution channel at MAFMA allows sellers to reach distribution points. Every point is functional and active. The fish processing area accommodates fish sorting, distribution, and buying and selling activities between sellers. The distribution of fish between the market and auction site is quite ideal. But the workers using north circulation are much more than the south counterpart. The south only used by buyers.

Another problem arises related to the amount of fish transported back and forth. The roads have to accommodate heavy truck around MAFMA complex. Insufficient structure or width often caused traffic jam and uneven roads around MAFMA complex.

4. Conclusion

Muara Angke Fish Market and Auction as a whole are feasible in terms of behavior. Analysis of environmental attributes is quite excellent in terms of sociality. However, some design improvements need to be made, primarily based on the assessment in terms of activity and accessibility.

- a. Overall, activities that occur at MAFMA are going well, but the mapping of rapid and long activities needs to be done more deeply so that there is no congestion at a certain point. Lack of cleaning and slaughtering services due to considering buying and selling wholesale.
- b. MAFMA users are fishermen, transport workers, sellers, and buyers. All users depend on the catch of fishermen's fish. Fishermen and transport workers live in the Muara Angke settlement, and most of them are not the Betawi ethnic group, who are local tribes. Some fishermen also act as sellers in the market by relying on colleagues to guard their merchandise when they are unable to.
- c. Accessibility leads to easy reach of all points, compatibility of functions with access, and clear division between each type of user's circulation. MAFMA circulation branched into two main roads, which reach the market and auction site separately. The mixing of circulating goods, fishermen, transport workers, sellers from the market, or auction site makes the north channels

congested, especially during the market's active phase. The auction site is located at the end of the circulation, away from access, regarding its non-public users. The separation is ideal for markets. The main problem is the insufficient width and structure around MAFMA to accommodate heavy truck. The result is bad condition roads and traffic jam on active phase.

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