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Land Arrangement with the Theme of Bioclimatic Architecture at the Durian Fruit Agrotourism Development Center in Ngoro District, Jombang Regency, East Java

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ABSTRACT

Ngoro Subdistrict is an area with potential in the development of Agrotourism in Jombang Regency, which is famous for its agricultural products in the form of superior durian fruit, and is one of the largest durian fruit production areas in East Java. Ngoro Subdistrict has an area of 49.86 km² which is dominated by rice fields (42%), followed by settlements (19%), forests (18%), moor (12%), and others. The soil conditions in the area are textured with napal sand loam or belong to the type of soil in the reddish-brown and lysotol mediteran complexes, where this soil condition is very suitable for planting plantations. The agro-tourism land arrangement in Ngoro District is designed in such a way with a land order that has natural nuances and is also creative. The orientation of the building mass and the laying of vegetation on the site are also considered to form a microclimate as well as support thermal comfort through passive shading and cooling, as well as being an accommodating area in various educational and tourist activities. Bioclimatic architecture has been applied to the design of land orders, namely conditioning the environment and adapting climate as well as human behavior in the interaction between humans and the environment. It is hoped that in the future it can provide benefits for the local community as well as the environment, aiming that local and domestic tourists can also enjoy the facilities in this agro-tourism. On the other hand, the design of durian fruit agrotourism in Ngoro is also to encourage and increase the income and welfare of the people in the area.

Keywords: Ngoro Subdistrict; Jombang; Land Order; Bioclimatic; Agrotourism

ABSTRAK

terbesar di Jawa Timur. Kecamatan Ngoro memiliki luas wilayah 49,86 km² yang didominasi oleh persawahan (42%), diikuti dengan permukiman (19%), hutan (18%), tegal (12%), dan lainnya. Kondisi tanah di area tersebut bertekstur lempung pasir napal atau termasuk jenis tanah pada kompleks mediteran coklat kemerahan dan lisotol, yang mana kondisi tanah ini sangat cocok untuk ditanami perkebunan. Tatahan lahan agrowisata di Kecamatan Ngoro ini didesain sedemikian rupa dengan tatahan lahan yang bernuansa alami juga rekreatif. Orientasi massa bangunan dan peletakan vegetasi pada tapak juga diperhatikan untuk membentuk iklim mikro juga menunjang kenyamanan termal melalui pembayangan dan pendinginan pasif, serta menjadi area yang akomodatif dalam berbagai kegiatan edukasi dan wisata. Arsitektur bioklimatik telah diterapkan pada rancangan tatahan lahan, yaitu mengondisikan lingkungan serta mengadaptasi iklim juga perilaku manusia dalam interaksi antara manusia dengan lingkungan. Diharapkan kedepannya dapat memberikan manfaat untuk masyarakat setempat juga lingkungannya, bertujuan agar wisatawan lokal maupun domestik juga dapat menikmati fasilitas – fasilitas yang ada di agrowisata ini. Disisi lain dirancangnya agrowisata buah durian di Ngoro ini juga untuk mendorong dan meningkatkan pendapatan dan kesejahteraan masyarakat di daerah tersebut.

Kata kunci: Kecamatan Ngoro; Jombang; Tatahan Lahan; Bioklimatik; Agrowisata.

INTRODUCTION

Ngoro is one of the potential areas in the development of Agrotourism in Jombang Regency, because Jombang is the largest durian fruit producer in East Java, and East Java is the largest durian fruit producer in Indonesia. The purpose of making this agrotourism is to increase income and community welfare by encouraging the development of people-based and sustainable agribusiness systems and businesses or not to damage the surrounding environment [1]. The development of Agropolitan Areas in Jombang Regency as stated in the 2009-2029 RTRW Document covers the areas of Mojowarno District, Bareng District, Ngoro District, and Wonosalam District. Agrotourism is a form of tourism activity that utilizes agro-business as a tourist attraction with the aim of expanding knowledge, travel, recreation and business relations in agriculture [2]. Through agropolitan development, it is hoped that there will be a strong interaction between the center of the agropolitan area and the area of agricultural production in the agropolitan area system. The development of agropolitan areas in each region means building agricultural-based regional economic growth points, with the hope that one growth point will be able to dynamize and stimulate the growth and development of other growing points and so on. If this process can run smoothly, the acceleration of rural economic growth can naturally be easily realized.

Therefore, in order to improve the agro-tourism development sector that supports the development of business fields in the field of trade and plantations, D'Dungo Agrotourism was made with the theme of Bioclimatic Architecture. The application of the Bioclimatic theme in the design of the Durian Fruit Agrotourism Development Center in Ngoro District, Jombang Regency, East Java will be able to provide benefits for the local community and also the environment, where in this planning and design it still pays attention to environmental sustainability and utilizes the existing potential without forgetting the existing ecosystem so that in the future it can be enjoyed by tourists both local and domestic who will visit this place. Designing an agro-tourism center that is in accordance with the conditions of the land or site with the application of the bioclimatic theme so that it can make optimal use of the land as an effort to maximize the development of the durian fruit agrotourism center in Ngoro, Jombang.

LITERATURE REVIEW

In developing tourism in Jombang Regency and aiming to improve the main sectors to advance economic activities, natural beauty, values and culture of East Java, agro-tourism was made in Ngoro [3]. Agrotourism or agricultural tourism is defined as a series of tourist travel activities that utilize locations or sectors from the beginning of production to obtaining products in various systems and scales with expansion, knowledge, understanding, experience and recreation in agriculture [4]. Bioclimatic Architecture has a close relationship between the adaptation of buildings and (human) residents to the climate, building conditions, and the behavior of human activities in buildings [5]. Agrotourism is a system of activities that is coordinated in the development of tourism and plantations or agriculture, and has a linkage of environmental conservation as well as improving the welfare of farming communities [6].

METHODS

The method of designing land arrangements in agrotourism uses bioclimatic architecture, the outline uses the concept of creative agro-tourism in designing land arrangements in this durian fruit agrotourism.

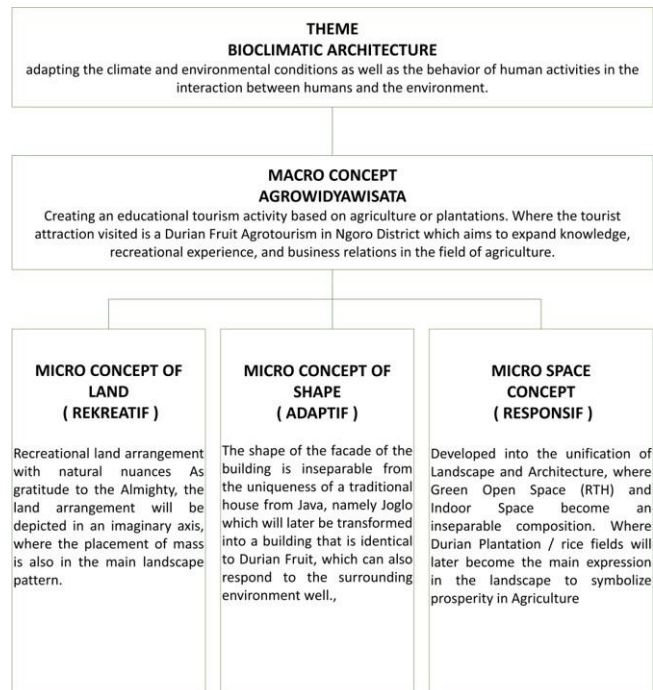


Figure 1. The Concept of Land Order Design for Durian Ngoro Fruit Agrotourism

The transformation of land order in agrotourism pays attention to the arrangement of the masses in accordance with the zonation and its function, and can maximize the land on the site which is divided into 3 zones, namely public zones, transition zones, and private zones.

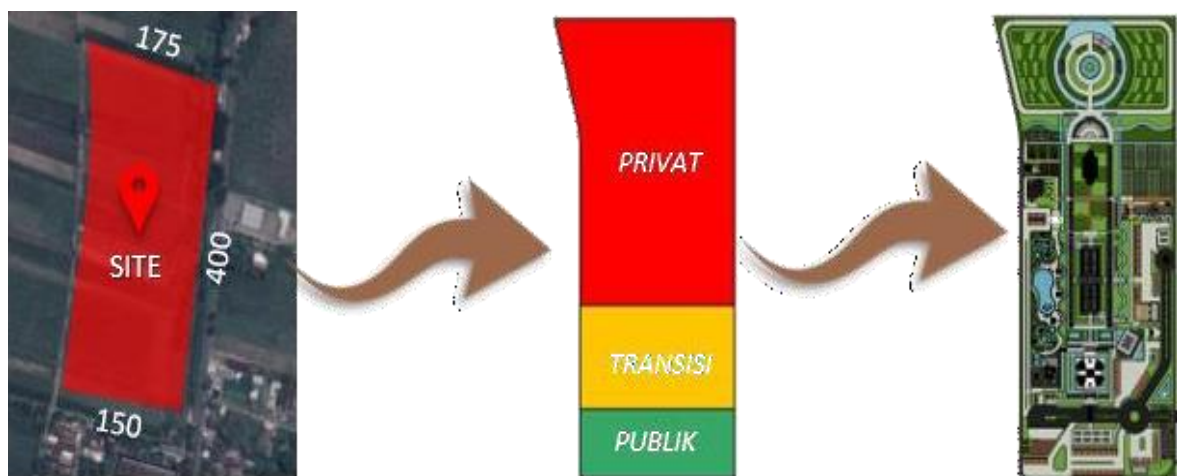


Figure 2. Transformation of The Land Order of Durian Ngoro Fruit Agrotourism

Land arrangement with a bioclimatic architecture, namely creating a land order design with natural and creative nuances as gratitude to the Almighty, in the land order will be depicted in an imaginary axis, where the placement of the masses is also in the main landscape pattern.



Figure 3. Site Plan of Ngoro Durian Fruit Agrotourism

D' Dungo's land order applies module 21. That is, every 21 meters on the land there is a land order that aims to prevent visitors from experiencing boredom. As well as the application of the principles of bioclimatic architecture is also expressed in the design concept where the environment and humans interact with each other and can adapt to the climate in the location.

RESULTS AND DISCUSSION

Sun Orientation

In an effort to minimize direct solar heat into buildings, indicators of bioclimatic architectural approaches that can be applied to buildings are laying building orientation, laying openings, laying materials, selecting sun-shading or secondary skin, choosing the skin color of buildings (paint), and laying vegetation.

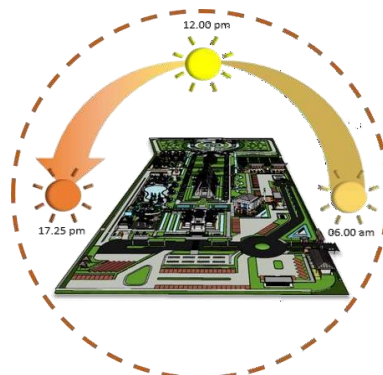


Figure 4. Sun Orientation

The orientation of the building also needs to be considered which is good facing north and

south, within the area of the position is in the longest building, namely the Galery & Exhibition building.

In this area, the opening system is implemented and the selection of suitable materials considering that the site will later get sufficient exposure to sunlight as well as to save energy in the building which will provide comfort for the occupants of the building during activities.

Rainwater and Wind Orientation

The order system on the site is given vegetation that aims to help direct the wind, utilizing air movement as a natural livelihood can apply indicators of a bioclimatic architectural approach in the form of laying building orientation, laying openings, and laying vegetation. meanwhile, for the rain flow, a drainage system will be provided located in each building, which later the water will be accommodated to water the plants at the site.

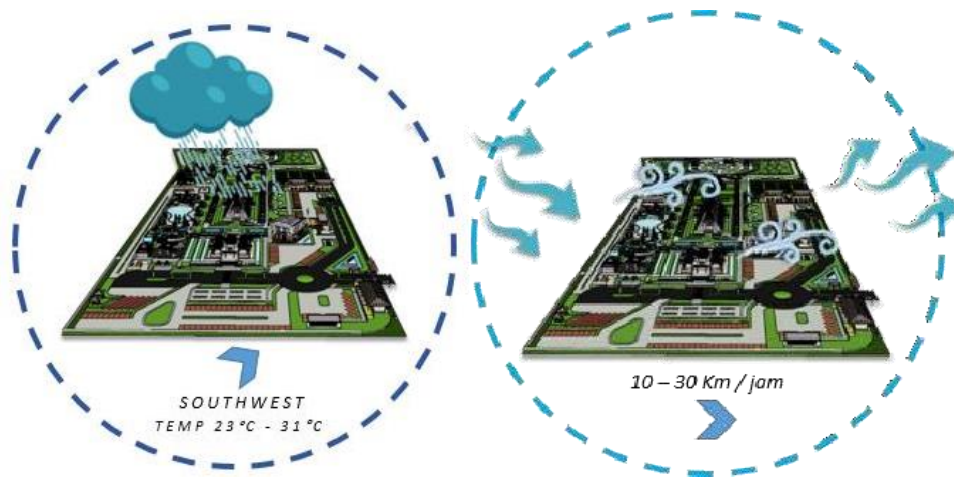


Figure 5. Rainwater and Wind Orientation

Noise Orientation

In this case, the selection of solutions for noise can be done by selecting the type of vegetation whose arrangement follows the concept of the building so that its aesthetics are also formed. In addition to vegetation, the use of some materials that can absorb or dampen noise in buildings can be considered [7].

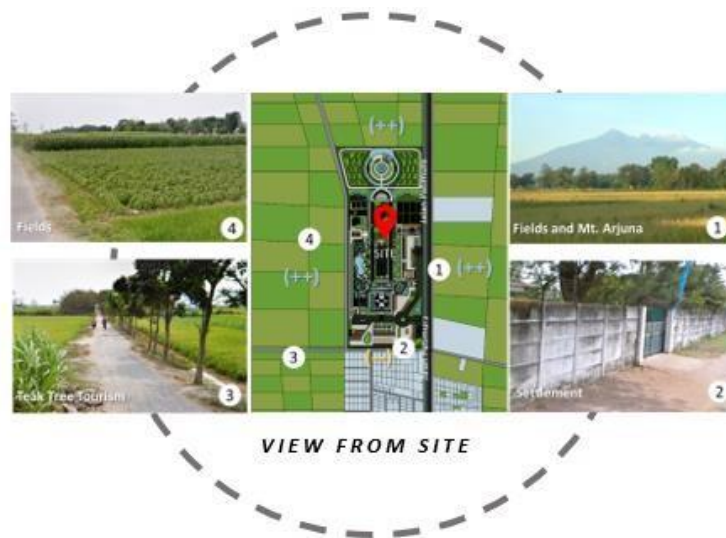


Figure 6. Noise Orientation

The use of the front side of the site as landscaping and the Southern part is given a barrier that aims to minimize noise that enters directly into the building.

View Orientation

View is closely related to orientation. With the selection of the right orientation and the processing of the shape of the building inside it will present an interesting view. And of course it will support the appearance of the building itself.



Regional Views and Pieces

The design of D'Dungo Agrotourism uses the concept of a creative micro-order area where this area is an educational recreational agro-tourism area. In the area, vegetation or greening is given and water elements such as ponds around buildings and spaces between buildings to look aesthetic, beautiful and able to provide comfort in this area.



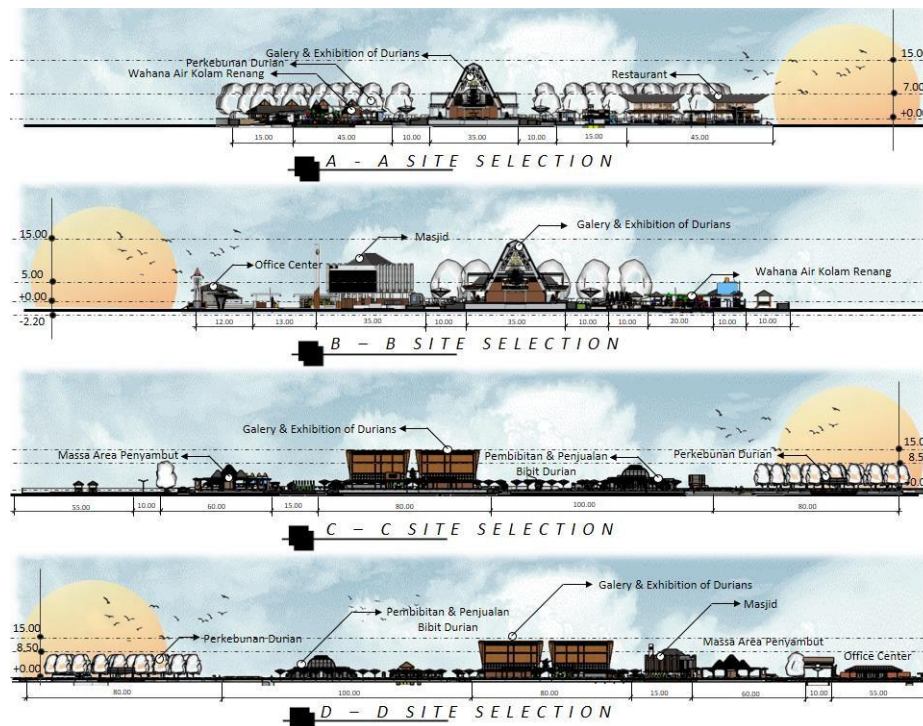


Figure 9. Selection of Durian Ngoro Fruit Agrotourism Area



Figure 10. Perspectives of Durian Ngoro Fruit Agrotourism Area

CONCLUSION

The results of the land order design are obtained from the results of previous transformations where the micro concept is adapted to the land arrangement with a bioclimatic texture, namely creating a land order design with natural and creative nuances as a gratitude to the Almighty, the land order will be depicted in an imaginary axis, where the placement of the masses is also in the main landscape pattern. Land Order in agrotourism has been designed using the concept of bioclimatic architecture, also passing through basic analysis of land design such as sun orientation, rain and wind orientation, noise orientation, view orientation. So as to give rise to a good composition of durian fruit agrotourism land arrangement, aiming so that local and domestic tourists can also enjoy the facilities in this agrotourism. On the other hand, the design of durian fruit agrotourism in Ngoro is also to encourage and increase the income and welfare of the people in the area.

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