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## Analysis of Open Green Space in the Area of Sriwijaya University Indralaya

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## 1 Analysis of Open Green Space in the Area of Sriwijaya University Indralaya

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### Abstract

Sriwijaya University Indralaya is one of the government university located in South Sumatera with the land area  $\pm$  700 Ha and the location is 38 kilometers from of Palembang city. In order to support the teaching and learning process, Sriwijaya University plans to develop green open space which can be utilized by every faculty. One of the faculty which have own and is willing to develop green open space is the agriculture faculty as Agroekoeuwisata area. This study is performed to support and to fulfill the facilities for the lecture and student in teaching-learning process and also utilizing the green open space needed for the development of the Agroekoeuwisata area. The research objective to analyze user characteristics, analyze space requirements, and plan the arrangement location and shape of buildings in green open space.

The location of this research is located in the Agroekoeuwisata area precisely behind the agriculture faculty Sriwijaya University Indralaya, Ogan ilir district, South Sumatera province. Respondents of this study are lecturer and students from all the Facultys in the Agriculture Faculty of Sriwijaya University Indralaya. This study retrieved the sample used the methods using the calculation of Slovin formula and proportional stratified random sampling. The questionnaire was distributed to 151 respondents who are 44 lecturers and 107 students. Furthermore, to analyze the need for green open space by direct interview and overall the analysis was conducted through interview and questionnaire that conducted by quantitative and qualitative descriptive methods. The results of the questionnaire are used as a reference to plan space requirements. Meanwhile, to obtain a site plan image, it is necessary to analyze the data in the form of situation analysis (height/depth of land used), quantitative and qualitative analysis based on respondents, space analysis, land zone analysis, circulation analysis and site plan analysis. Therefore, on that basis, this study obtained structure, layout, and shape of the building to plan a green open space in the Agroekoeuwisata area of the Agriculture Faculty of Sriwijaya University Indralaya.

Keywords: *Open Green Space, Space Requirement, Design Site Plan*

### 1. Introduction

The land area  $\pm$  700 Ha of Sriwijaya University is located 38 kilometers in the south of Palembang city. The location will be used for the centre of educational activities for Bachelor Degree who focusing their study to develop green open space. Currently, Sriwijaya University has 10 ten departments. They are a department of Economics, Department of law, department of Medicine, Department of engineering, department of Agriculture, Department of teacher training and educational sciences, department of social and political sciences, department of sciences, department of computer science and the department of public health. An empty land behind the campus that would later serve as green open space that supports the activity of the human resources at the campus including the professors and students. This research aims to analyze the space that needed for lecturer and students at green open space area to run the education activities of all the entity at Sriwijaya University which



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located in Indralaya. [1] stated that green open space in campus ideally have a physical function among other things as a function of aesthetic, microclimate controller and shading places and provides the convenience of its users to have activity in the green open space. Moreover, another green open spaces function is to support educational activities, conservation, recreation, and identity. All functions of the green open space can be maximized. Therefore, it needs to be done further studies to arrange the space needed. The structure of the green open space landscape using dekritive method of quantitative and qualitative interviews with direct observation, literature review dan documentation. [4]

This study will determine the space requirements for the activities of the Faculty and students in the areas of green open space. Many studies have been done in the needs of the analysis of green open space for either urban or campus area. [2] conducted a study to identify the character and organization of open spaces and buildings in the campus environment of Sriwijaya University. The result of the research shows the campus of Sriwijaya University has a unique character with the architecture of the building has the style like the building in South Sumatra island. The open space on the environment Sriwijaya University campus needs to be arranged so that it can be used as a place of communal spaces of interaction/learning space outside of the room. Moreover, another study by [3] has a purpose for a tourist attraction that can meet the needs of recreational activity and it needs a sustainable planning. The object is Mas Harun Bastari Rejang Lebong attractions Lake. This research uses the environmental aspects as a cornerstone of basics tourism planning. This research took three process i.e. inventory, analysis and synthesis. Physical and cultural data collected in the process of inventory. Data from these inventories are analyzed to create the basics of planning and reveal the potential and dangers at the site. The concept was developed in the process of synthesis. The results of this research are the landscape plan.

Students are the main actors who will use public spaces in a College along with the officer and the lecturer. This brings the impact that humans as a userspace have a very large role in determining the quality of space [4] suggests that students spend most of their time outside the classroom with their peers to discuss the academic work or other topics. Different kinds of communication devices including laptops, smartphones, etc. when equipped with wireless access (Wi-Fi) are everywhere, allowing nearly every room to be a meeting room which can be used for learning, students collaborate, and socialize. Open spaces (informal) often combine food service and wireless access, ideal for leisurely activities including searching on the Internet, through e-mail, or chat with friends. Students are no longer limited to computer terminals, indoor and outdoor spaces can be a field of study or social space for the internet and available resources. There are some traditional assumptions of rethinking learning spaces open Setup: a student relaxing in the grass or on the floor of the campus with a laptop, several hundred students listen in the Lecture Hall, students work together on a table outside the campus, a student learns in spaces such as halls on campus, a student reading a book on the floor, a window, or on the edge of campus access road, a group of students mingled to discuss in the laboratory. The role of social interactions and the environment mutually reinforce each other with the open space on campus. The following elements may be a consideration for the creation of green open space. This research will create a design of green open space of Sriwijaya university based on the needs of the faculty and students where the information is collected through a questionnaire. Moreover, the literature review will be discussed to add more information to design the green open space at Sriwijaya University.

## 2. Research methodology

This study will use both primary and secondary data to construct the green open space plan of Sriwijaya university. Figure 1 is the framework of this study. This research was conducted in the area of Agroekowisata University of Sriwijaya which located at Indralaya Ogan Ilir, with a land area of approximately 100 Ha as shown in figure 1. And the area of the research is described in figure 2. Table 1 is the distribution of the samples dataset that has collected in this research.

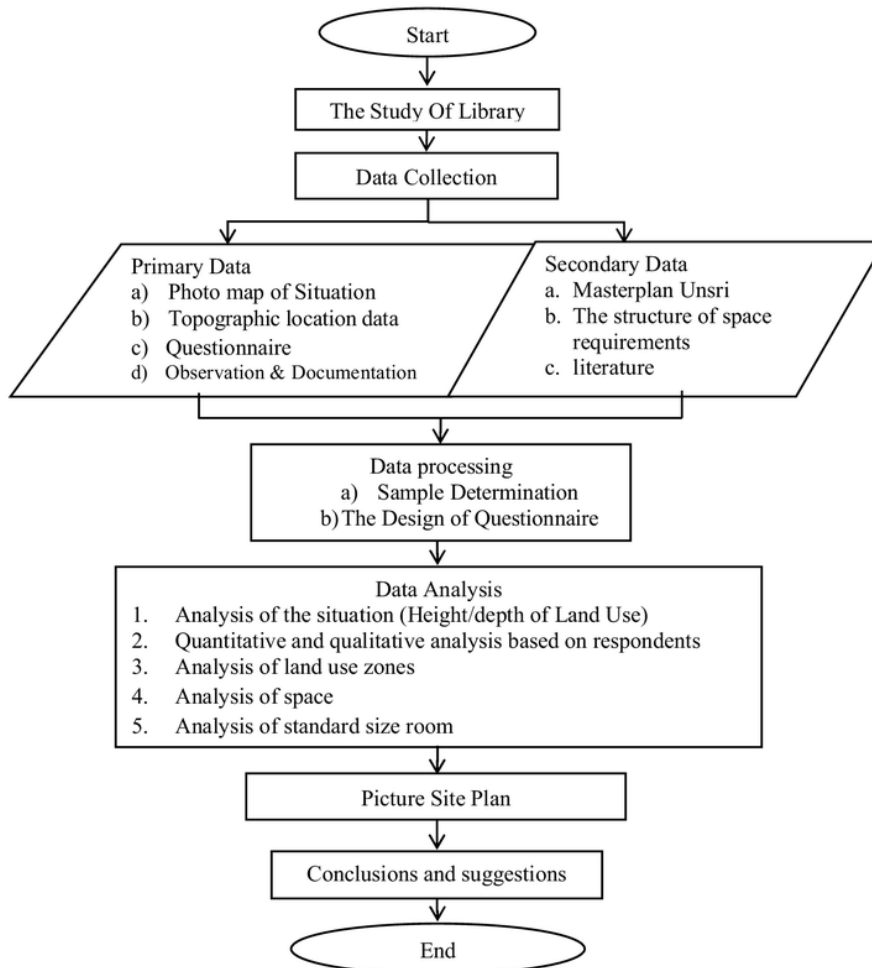
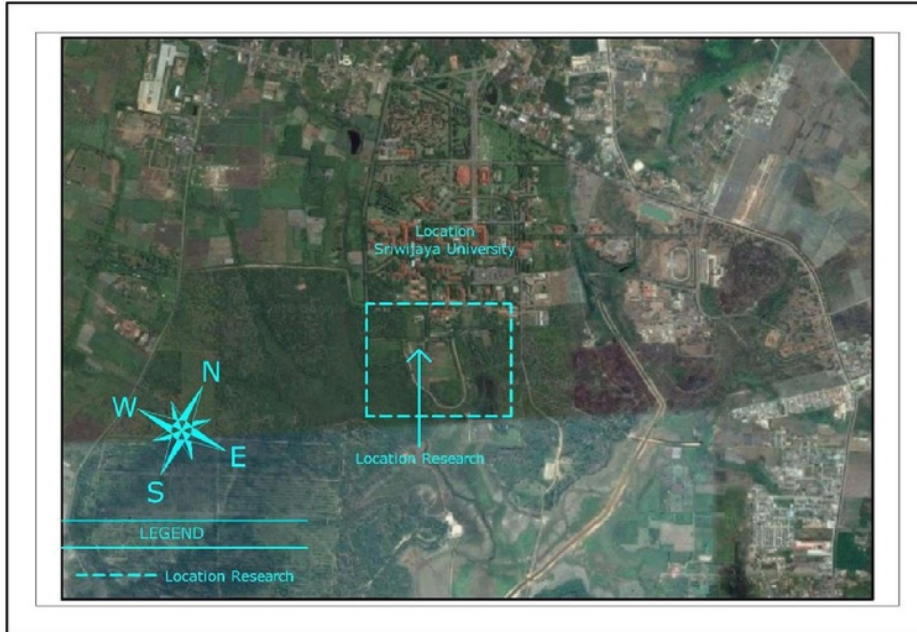


Figure 1. Research flowchart



**Figure 2.** Location of the research

**Table 1.** The Number of Sample in Agriculture department

No.	Major/program Study	Lecturer	Student
1	Agribusiness	9	27
2	Agroekoteknologi	2	10
3	Agronomy	6	9
4	Aquaculture/aquaculture	3	7
5	Plant Protection	3	2
6	Soil Science	5	11
7	Farm	4	11
8	Agricultural Engineering	5	11
9	Fishery Product Technology	3	8
10	Agricultural Technology	4	11
The Number Of Sub Total		44	107
The percentage of (%)		25	75
The Total Number Of		151	



The population here is the Lecturer and students at Indralaya. The population is represented by the amount of the percentage by some population that exists in the Faculty of agriculture in each Department with the calculation and distribution of population sampling as follows [5]:

Slovin formula :

$$n = \frac{N}{1 + N \cdot e^2}$$

$n$  = sample

$N$  = Population

$e$  = critical value

Method of *Proporsionate Stratified Random Sampling*

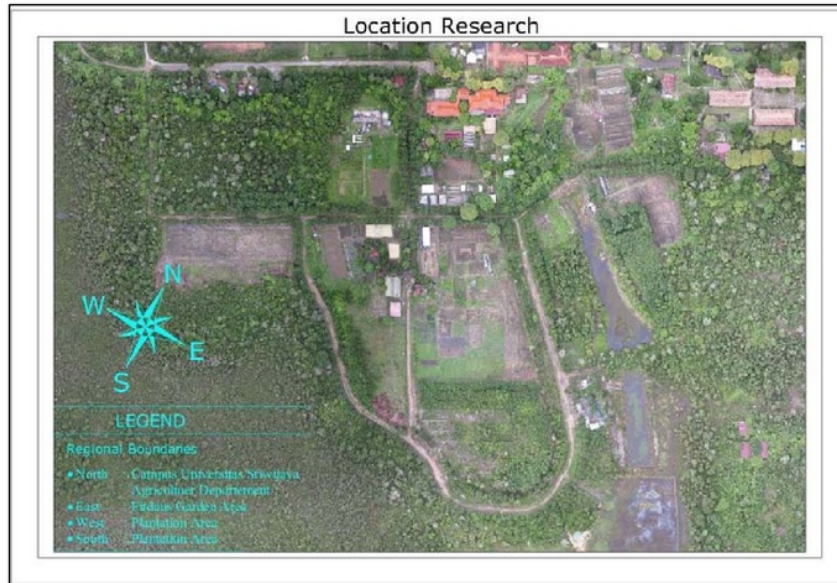
Number sample in concentration study =  $\frac{\text{Sample size}}{\text{Population total}} \times \text{Population number in concentration study}$

Sample retrieval techniques in the study using the determination of the total population of respondents used the method of *Proporsionate Stratified Random Sampling*. *Proporsionate Stratified Random Sampling* where Populations are grouped into subcategories based on certain criteria's population owned elements of the population. This study spread the questionnaire to the agriculture students and lecture as shown in Table 2.

### 3. Results

#### 3.1 Analysis of the location

Figure 3 shows the location that will be used for this study to construct a green open space at Sriwijaya university which is located at Indralaya. This design will be useful for the agriculture department activities.



**Figure 3.** Location research (source: Map of air format small)

#### 3.2 Quantitative and qualitative analysis based on respondents

The respondent included in this research are from the agriculture department at Sriwijaya University which located in Indralaya. That department has ten programs. This study selected the respondents



from the agriculture department because mostly the students have outdoor activities. Table 2 shows the recapitulation the need for open green space user

**Table 2.** Recapitulation of the characteristic of open green space user where the respondents are lectures and students

Characteristic	Respondent	
	Lecturer (%)	Student (%)
<b>Characteristics of socioeconomic</b>		
Status	44 people (29,14)	107 people (70,86)
Location	Palembang (68,18)	Indralaya (inside campus) and Indralaya (out of campus) (39,25)
Semester	-	semester 8 (31,78)
<b>Characteristics of space requirements</b>		
Motivatrion at green open space area	Experiment/Practicum (50,00)	Recreation (48,60)
Educational activities at green open space area	Practicum (50,00)	Practicum (47,66)
The suitable land	Dry (72,73)	Humid (43,93)
Accommodation and transportation type at green open space area	Open space (43,18)	Open space (30,84)
Time allocation at green open space area	AM (06-10) (50,00)	PM (15-18) (69,16)
Duration of activities at green open space area	1-3 Hours (72,73)	1-3 Hours (62,62)
Supporting infrastructure at green open space area	Worship place and seating (25,00)	Wi-Fi (32,71)
The frequency to be visited estimation	One in a week and rarely (1-3 times in a week) (38,64)	Slightly often (3-6 times in a week) (27,10)
Characteristic of the people or students quantity estimation at green open space area	> 10 people (63,64)	> 10 people (47,66)

The recapitulation result of quantitative and qualitative analysis where the respondents are from students and lecturer of agriculture department which is used as the standard for the calculation of the space capacity requirement.

### 3.3 Analysis of the existing and the planning location

The location is divided into three zones. First, the private zone is an area that needs a quite area where only the particular person who can enter that area. Second, semi-public zone as a switching area into a private zone where space can only be used for the concerned people. Third, the public zone is used for parking area and this location has a high noise. Figure 4 and 5 show the existing location and the planning location, respectively.

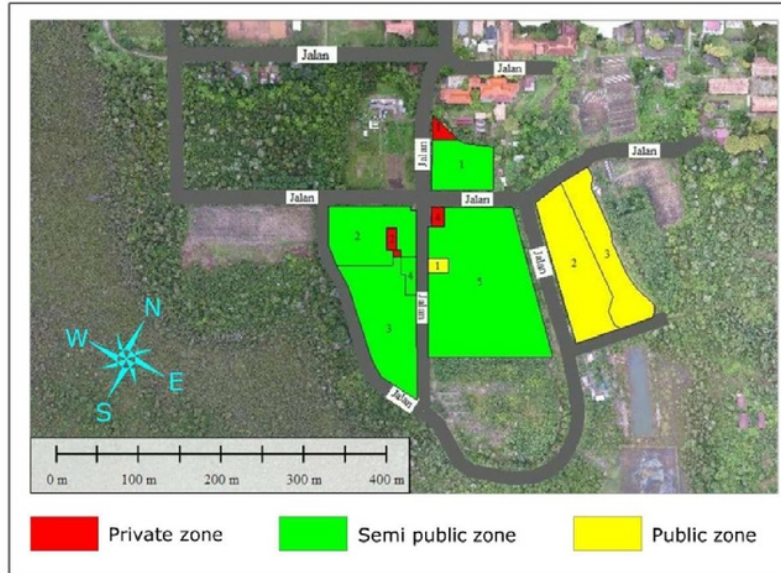


Figure 4. The existing location

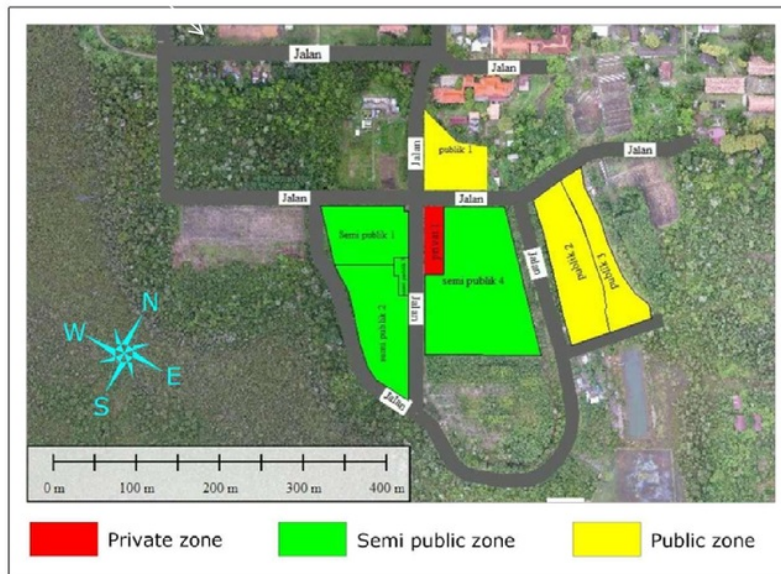


Figure 5. The planning location

There is a difference between the existing and the planning location; the difference can be seen in the deduction or addition in each zone: In the private zone, the planning of private zone

consists of reparation, office, laboratory, guest house, security post, and water management. A private zone is grouped become one area, and it will be located in the middle of location. The consideration is because it is easy to be accessed by the user and from the safety consideration the location is nearby security post. In the semi-public zone, the planning of semi-public zone does not have many changes from the initial condition. It only conducts the arrangement and repair of the buildings which are farmland which is initially a semi-permanent to become permanent and only utilize the land which has not been properly managed and the building where the condition is need to be renovated. And in the Public zone, the planning of public zone is divided into three zones, the first zone is consisting of the parking area, canteen, toilet, and worship room. The second zone is consisting of open space, seating place, sport park, and gazebo. The third zone is consisting of pool retention, and jogging track. The first area is located in the front, north of the location with the consideration as a separation between the reception room and the others room.

#### 3.4 Circulation analysis and site plan analysis

The circulation planning is divided into three, as the following the circulation of the pedestrian area, the circulation of public transportation and the circulation of the particular vehicle as described in figure 6. And in the last step, this research design a site plan which is described in figure 7.

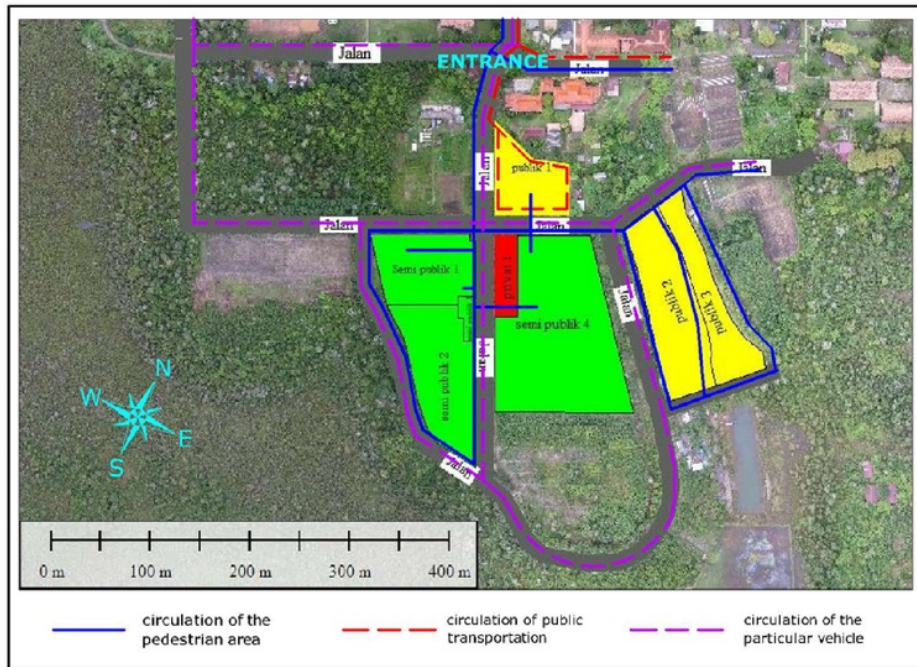


Figure 6. The planning of the circulation flow



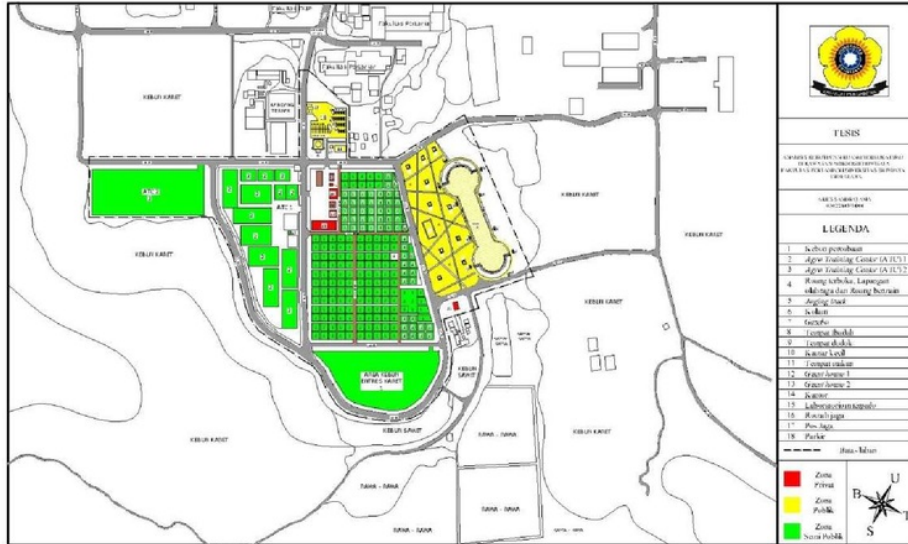


Figure 7. Design of site plan

### 3.5 The recapitulation of the space need

This research already collected and designed the demand of the space which is described in the table 3 included the amount of rooms, size of the room and the quantity of the stuff which can be fit in the designed and size of the room.



**Table 3.** The recapitulation of the space need

No	The space need	Amount of rooms	Size of the room (m2)	The quantity of the stuffs (m2)	The space need
a	Practicum /				
	1) experimental garden				
	experimental garden skripsi	10	Area	1.000	10.000
	Entres garden rubber	10	Area	1.000	10.000
	Cultivation Garden	10	Area	1.000	10.000
	2) <i>Agro training center (ATC) 1</i>				
	Large rice field	8	Area	1.100	8.800
	Small rice field	5	Area	312	1.560
	Holtikultural plant	5	Area	1.155	5.775
	3) <i>Agro training center (ATC) 2</i>				
	Fruit garden	7	Area	1.430	10.010
b	Open space, sport center, and play room	1	Area	10.455	10.55
c	<i>Joging track</i>	1	Area	11.150	11.150
d	Pool	1	Area	10.455	10.455
e	<i>Gazebo</i>				
	1) <i>Small gazebo</i>	10	Area	20	200
	2) <i>Large gazebo</i>	1	Area	220	220
f	Worship room	1	Unit	140	140
g	Seating desk	10	Unit	14	140
h	Toilet	3	Unit	20	60
i	Canteen	1	Unit	440	440
j	<i>Guesss house</i>				
	1) <i>Guesss house 1</i>	1	Unit	64	64
	2) <i>Guesss house 2</i>	1	Unit	90	90
k	Office	1	Unit	260	260
l	Integrated laboratory	1	Unit	260	260
m	Guardhouse	2	Unit	60	120
n	Security post	1	Unit	25	25
o	Parking area	1	Area	778	778

#### 4 Conclusion

The conclusion of this research is divided into three majors which are quantitative and qualitative analysis results based on the respondent, space requirement analysis results and design planning of site plan image.

##### 4.1 Quantitative and qualitative analysis based on respondents

Characteristics of prospective users of green open space based on questionnaires on lecturer respondents and students are: the characteristics of green open space users in the campus of Sriwijaya University Indralaya based on socioeconomic aspects are 44 people or 29.14% as lecturers and 107 people or 70.86% college student. Based on the residence of lecturers 68.18% residing in Palembang and 39.25% of students living in Indaralaya both inside and outside the campus. Based on the composition of the large student respondents is a student of the 8th semester with a percentage of 31.78%. Characteristic of green open space user in the campus of Sriwijaya Indralaya University

based on an aspect of space requirement. Based on the motivation of green open space, the majority of lecturers chose experiment/practice as much as 50.00%, while 48.60% of the respondents chose recreation and 31.78% chose experiment / practice. Based on educational activities in green open space, lecturer and student respondents chose the practicum place that is 50% and 47,66%. Based on suitable land type 72.73% of lecturers choose dry land and 43.93% of students choose moist land. Based on the type of green open space facilities and infrastructure, both lecturers and students choose open space with a percentage of 43.18% and 30.84% respectively. Based on activity time in green open room, lecturers choose morning (06-10) that is equal to 50% while student choose afternoon (15-18) that is equal to 69,16%. Based on the duration of activity in the green open space of lecturer and student respondents choose 1-3 hours that is equal to 72,73% and 62,62%. Based on supporting facilities of infrastructure that is open room open green lecturer chooses the place of worship and seat worth 25% and student valued 32,71% choose wifi. Based on the estimated frequency of visits lecturers choose once a week (1-3 times a week) that is 38.64% and students choose frequent frequent frequencies (3-6 times a week) of 27.10%. Based on the estimated characteristics of the number of lecturers / students in green open lecturers and students choose > 10 people that is equal to 63.64% and 47.66%.

#### 4.2 Space requirements analysis

Spatial needs analysis based on questionnaires and interviews on lecturer and student respondents at the Faculty of Agriculture Sriwijaya Indralaya University are based on questionnaires of total area for the experimental garden space 22,500 m<sup>2</sup>, agro training center (ATC) that is 22,500 m<sup>2</sup>, open space, sports field and space 10,455 m<sup>2</sup>, 10,455 m<sup>2</sup> of jogging track, 10,455 m<sup>2</sup> of pool, 12 m<sup>2</sup> x 10 until gazebo which is 120 m<sup>2</sup>, place of worship 182 m<sup>2</sup>, seat 14 m<sup>2</sup> x 10 unit that is 140 m<sup>2</sup>, restroom is 16 m<sup>2</sup> x 3 units of 48 m<sup>2</sup>, and a dining area of 122 m<sup>2</sup>. Based on the interview of space requirement, guest house 1 is 64 m<sup>2</sup>, guest house 2 is 90 m<sup>2</sup>, office area is 140 m<sup>2</sup>, the integrated laboratory is 384 m<sup>2</sup>, guard house 160 m<sup>2</sup> x 2 unit that is 120 m<sup>2</sup>, and guard post 21 m<sup>2</sup>, parking area of 615 m<sup>2</sup>. The total area of green open space in the area of Sriwijaya University Campus is 109,984 m<sup>2</sup>

#### 4.3 Design of the site plan

Green open spaces are grouped into 3 zones according to the function of which are as follows: private zone consists of workshop, office, guest house 1, guest house 2 and guard house. The semi-public zone consists of an experimental garden, agro training center (ATC), restroom, and guard house. Public zone consists of open space, sports field, playroom, jogging track, pond, gazebo, place of worship, seating, restroom, dining area, guard house, guardhouse, and parking area.

The long-term suggestion and plan that can be taken in this research is need to be further investigated about the need of laying of the building based on contour because this research is only drawing the site plan of the time period so that it is required a detailed drawing Engineering Design drawing and cost plan calculation.

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