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The Community Perceptions on Roof Garden Benefit in Multi-Story Building Malang City

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Abstrak

The community perception of Roof garden benefits is important to implement roof garden. This research aims to determine the community perception about the potential of rooftop into a roof garden in Malang city. Data collection is done with field observation to get the data of multi-story building with the potential of rooftop into a roof garden in Malang City. The primary data source is chosen purposive a number of 50 people from lecturers, students, employees and visitors. The variables used for this study were ecological variables, aesthetics, economics, cultivation and crop protection. On the ecological variable respondents was at 1% strongly disagree, 7% disagree, 18% uncertain, 48% agreed, 26% very agreed. On the aesthetics variable respondents was at 1% strongly disagree, 7% disagree, 18% uncertain, 48% agreed, 26% very agreed. On the economic variable respondents was at 3% strongly disagree, 11% disagree, 31% uncertain, 38% agree, 16% very agree. On the cultivation variable respondents was at 2% strongly disagree, 2% disagree, 8% uncertain, 50% agree, 38% very agree. On the plant protection variable respondents was at 2% strongly disagree, 3% disagree, 11% uncertain, 45% agree, 38% very agree.

Keywords : Roof garden, benefits, perception

INTRODUCTION

Roof garden is a development project in the 1980s in Germany. Then followed the development of other European countries such as Switzerland, the Netherlands, Austria, Great Britain, Italy, France and Sweden. In 1983, the city of Linz (Austria) developed an umbrella project, followed by Switzerland in 1990.

In America, the city of Chicago became the first city to set up a roof garden. Then follow other cities like New York, Washington, Portland and Atlanta (Wikipedia, 2008 in the article of 2012). In Asia, countries such as China, South Korea, Japan, Hong Kong and Singapore are not inferior to the developed countries for rooftop projects.

In Malang, the use of roof gardens in multi-story building is still minimal. Considering that Malang City is the second largest city in East Java after Surabaya. In 2017, the population of Malang City was 895,387 (Wikipedia, 2019). The population density of Malang City has disrupted many activities in Malang City, especially in terms of air quality. Maintaining air quality by adding Green Open Space (GOS). One of these is the use of a roof in multi-story building as a roof garden.

People still do not know the benefits of the roof garden. The public perception of the benefits of roof gardens is important to realize roof gardens. Rooftop garden can offer ecological and economic benefits. Ecological benefits include maintaining air quality in the city, absorbing noxious gases, adding green space, future agricultural solutions, etc. The economic benefits of rooftop gardens increase the income from cultivation, become a recreational park, and save money on use of air conditioners.

This study aims to determine the public perception of the potential of a rooftop into a roof garden in Malang City.

RESEARCH METHODOLOGY

This research used a descriptive quantitative method. Quantitative descriptive research aims to

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describe an event by using numbers to describe a single or group feature.

This research was conducted from January to March 2019 in multi-story buildings on Malang City.

DATA COLLECTION

The data collection was done through field observations to obtain data on multi-story buildings with the potential of rooftop into a roof garden in Malang City. Primary data sources were specifically selected with up to 50 people from the components lecturers, students, staff and visitors **(Table 1)**.

The variables used for this study are ecological, aesthetic, economic, cultivation and plant protection variables.

No	Building	Characteristic					
		Gender		Status			
		Men	Women	Lecture	College student	Employee	Visitor
1	Agriculture Faculty of UB	3	5	3	5	0	0
2	Fishing Faculty of UB	2	4	2	4	0	0
3	Agriculture Result Technology Faculty of UB	3	2	2	3	0	0
4	Law Faculty of UB	2	3	2	3	0	0
5	Amaris Hotel	3	3	0	0	4	2
6	Ibis Style Hotel	4	4	0	0	5	3
7	Radho Syariah Hotel	4	2	0	0	4	2
8	Aria Gajayana Hotel	2	4	0	0	3	3

Table 1. Respondent characteristic
Sources: Analisys, 2019

RESULT AND DISCUSSION

The Community Perception on Roof Garden Benefits

The Community Perception of the ecological variable benefit.

The results of analysis community perception about the ecological variables benefit amounting to 50 respondents in table 2 can was know at 1% strongly disagree, 7% disagree, 18% uncertain, 48% agreed, 26% very agreed.

In the table described the roof garden indicator can prevent ultraviolet radiation from the sun directly into the highest answer for the agreement. The existence of a roof garden in a building can create an ecological city. According to Sitawati (2006), an ecological roof garden offers many uses, namely : conditioning of the environment, as the roof garden as a micro-climate regulator can reduce carbon and become a new habitat for animal species.

Table 2. Ecological variable indicator

Variable	Questions	SD	D	U	A	VA	Total
Ecological	Roof garden can maintain air quality	0	1	3	24	22	**50**
	Roof garden can absorb pollutant gas	1	8	15	20	6	**50**
	Roof garden can prevent ultraviolet radiation from direct sun	0	1	4	28	16	**49**
	Roof garden solution for upcoming farm	0	2	10	24	14	**50**
	Roof garden can cooling the building under	0	4	11	24	11	**50**
	Roof garden of narrow land farming solution	0	8	8	26	8	**50**
	Roof garden become green environment	1	3	10	22	14	**50**
	Roof garden can reduce carbon substances	0	2	10	24	14	**50**
Total		**2**	**29**	**71**	**192**	**105**	**399**
Percentage (%)		**1**	**7**	**18**	**48**	**26**	**100**

Des : SD = Strongly Disagree, D = Disagree, U = Uncertain, A = Agree, VA = Very Agree
Sources : Analisys, 2019

The Community Perception of the aesthetic variable benefit.

The results of analysis community perception about the aesthetic variables benefit amounting to 50 respondents in table 3 can was know at 2% strongly disagree, 1% disagree, 7% uncertain, 49% agree, 47% very agree.

In general, the existence of a roof garden in urban areas will enhance the green space of an

urban area. In addition, the roof garden becomes the aesthetic value of a building. Therefore aesthetic value visualizes visitors in the roof garden. According to Kuhn (1995), the economic advantages of a roof garden offer the visitor a resort and give a building or house an aesthetic value.

The dominance of community perception responses, which agree on the benefits of aesthetic variables and agree strongly, shows that the roof garden can add value to the building.

Table 3. Aesthetic variable indicator

Variable	Questions	SD	D	U	A	VA	Total
Aesthetic	Roof garden can create beauty on the roof	1	0	4	28	17	**50**
	Roof garden add aesthetic of building	1	1	3	21	24	**50**
Total		**2**	**1**	**7**	**49**	**41**	**100**
Percentage (%)		**2**	**1**	**7**	**49**	**41**	**100**

Des : SD = Strongly Disagree, D = Disagree, U = Uncertain, A = Agree, VA = Very Agree
Sources : Analisys, 2019

The Community Perception of the economic variable benefit.

The results of analysis community perception about the economic variables benefit amounting to 50 respondents in table 4 can was know at 3% strongly disagree, 11% disagree, 31% uncertain, 38% agree, 16% very agree.

From this table, the roof garden indicator adds the production to the highest answer for the agreed category.

The benefits of the roof garden add to the aesthetic value of buildings and ecology, which can bring economic benefits. Economic benefits can bring additional income to those who do so. In addition to the economy of a building. According to Sukaton et. al (2004) and US EPA (2006), the comfort of a rooftop garden will enhance public awareness that the existence of a rooftop garden can add value to the building.

Tabel 4. Economic Variable Indicator

Variable	Questions	SD	D	U	A	VA	Total
Economic	Roof garden add production result	1	2	17	24	6	**50**
	Roof garden reatment is easy	5	8	14	16	7	**50**
	Roof garden become a recreation facility	0	4	16	19	11	**50**
	Roof garden can increase income	0	4	20	22	4	**50**
	Cost of manufacturing cheap roof garden	2	9	12	18	9	**50**
	Building capital of roof garden relatively inexpensive	0	5	11	15	19	**50**
	Roof garden can conserve energy from AC	4	7	20	18	1	**50**
Total		**12**	**39**	**110**	**132**	**57**	**350**
Percentage (%)		**3**	**11**	**31**	**38**	**16**	**100**

Des : SD = Strongly Disagree, D = Disagree, U = Uncertain, A = Agree, VA = Very Agree
Sources : Analisys, 2019.

The Community Perception of the cultivation variable benefit.

The results of analysis community perception about the cultivation variables benefit amounting to 50 respondents in table 2 can was know at 2% strongly disagree, 2% disagree, 8% uncertain, 50% agree, 38% very agree.

The results of the questionnaire provided data that the community agreed to and strongly agreed with the choice of plant species on the roof garden. In addition to the selection of plant types, the selection of planting media for plant growth should be good.

The choice of planting media also plays a role in order not to burden the roof. Types of plant media that are suitable for use in the roof garden are Kokostorf, roasted shells, compost, manure and others. A safe place for cultivation on the roof garden is a board made of lightweight materials, polybags and adobe. According to Noverita (2005), the selection of planting materials and containers on the roof garden must be the same in order to improve the cultivation results on the roof garden.

Table 5. Cultivation variable indicator

Variable	Question	SD	D	U	A	VA	Total
Cultivation	The plant features in the roof garden are short-rooted, resistant to water, and grow at high temperature	1	1	4	25	19	**50**
Total		**1**	**1**	**4**	**25**	**19**	**50**
Percentage (%)		**2**	**2**	**8**	**50**	**38**	**100**

Des : SD = Strongly Disagree, D = Disagree, U = Uncertain, A = Agree, VA = Very Agree
Sources : Analisys, 2019

The Community Perception of the plant protection variable benefit.

The results of analysis community perception about the plant protection variables benefit amounting to 50 respondents in table 6 can was know at 2% strongly disagree, 3% disagree, 11% uncertain, 45% agree, 38% very agree.

The presence of pests and diseases is always harmful to humans. From the results of the questionnaire data emerged that the community agreed with and strongly agreed to the presence of very disturbing pests on the roof garden. The presence of pests can affect the potential economically, namely to reduce the number of visitors and damage plants on the roof garden. Plant care is carried out to prevent the presence of pests. According to Luckett (2009), the survival of plants on the roof garden requires effective care of the roof garden.

Table 6. Plant protection variable indicator

Variable	Questions	SD	D	U	A	VA	Total
Plant Protection	Pest can interfere with visitor	1	1	4	25	19	**50**
	Pest can harm crops	1	1	3	21	24	**50**
	Roof garden become a new habitat for pests	1	3	10	22	14	**50**
Total		**3**	**5**	**17**	**68**	**57**	**150**
Percentage (%)		**2**	**3**	**11**	**45**	**38**	**100**

Des : SD = Strongly Disagree, D = Disagree, U = Uncertain, A = Agree, VA = Very Agree
Sources : Analisys, 2019

CONCLUSION

a) 48% of respondents said they agreed, based on a survey on people's perceptions of the potential of a roof garden, based on environmental benefits and 26% very agreed, 18% uncetain, 7% disagreed, 2% strongly disagreed.
b) 49% of respondents agreed, based on a survey of people's perceptions of the potential of a roof terrace as a roof garden, based on aesthetic benefits and 41% very agreed, 7% uncertain, 1% disagreed, 2% strongly disagreed.
c) 38% of respondents said they agreed based on a survey of people's perceptions of the potential of a rooftop into roof garden based on economic benefits and 16% very agreed, 31% uncertain, 11% disagreed, 3% strongly disagreed.
d) 50% of respondents said they agreed, based on a survey on the perception of the community about the potential of a roof garden, based on the benefits of management and 38% very agreed, 8% uncertain, 2% disagreed, 2% strongly disagreed.

e) 45% of respondents agreed, based on a survey on people's perceptions of the potential of a roof terrace as a roof garden, based on the benefits of plant protection and 38% very agreed, 11% uncertain, 3% disagreed, 2% strongly disagreed.

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