

Improving The Quality Of Life Of The Academic Community In The Application Of Green Campus At The Muhammadiyah Riau University

Bakaruddin* , Agus Irianto, Idris, Hasdi Aimon

*Universitas Muhammadiyah Riau, Universitas Negeri Padang, Indonesia, E-mail address: Bakaruddin@umri.ac.id

Abstract— The purposes of this study were to formulate of policy strategy into quality of life enhancement on Green Campus Implementation. The method used is sequential mixed method. The formulation of policy Strategy used SWOT analysis. The results of this study were quite appropriate category on 1.74 score of Society of Academicians perception and 50,13% of structural officials. This result were not yet showed maximal score, but even closer minimal score. The minimal score or appropriate category were; (1) environmental management were important for campus, (2) greenhouse gas emissions were important practice for campus, (3) waste management were important practice for campus, (4) waste management were support to highest quality of life, (5) campus transportation were support to highest quality of life, and (6) environmental education were support to highest quality of life. The formulated of policy strategy, that are; management campus system policy enhancement, organization system green campus policy enhancement, green outdoor and building policy enhancement, waste treatment infrastructure policy enhancement, environmental knowledge policy enhancement, and motor vehicle reducing policy enhancement.

Keywords: Swot analysis, Quality of life, Green campus, Policy Strategy.

Highlight

- The formulation of policy strategy used SWOT analysis
- Policy for upgrading the campus environmental management system is outlined in 3 action plans
- Policy to improve the green campus organizational system is described in 3 action plans
- Policy to increase environmental knowledge is outlined in 3 action plans
- Policies for building green open spaces and building improvements are outlined in an action plan for planting green plants and reducing greenhouse gas emissions.

I INTRODUCTION

In the last decade, the earth's population has been carrying out long debates and discussions in finding solutions to anticipate its adverse effects and think about the future for the next generation. Sustainable development and meridians that focus on environmental, economic, and socio-cultural aspects are expected to help anticipate the impacts of climate change. The campus environment is a small part of the global community that should fight against climate change and sustainable development. Technology, science, and innovation are upheld and become a community at the local level that plays an important role in contributing to implementing the principles of sustainability in its environmental scope. The campus environment is also an inseparable part of the urban ecosystem, which has a significant role and contribution to increasing and decreasing global warming.

Nowadays, the green campus program in Indonesia has

started to be run by the government by appointing various government agencies related to the green campus concept. The Indonesian campus, which is ranked highest in the world, is the University of Indonesia. Universitas Indonesia (UI) initiated a World University Ranking in 2010, which became known as the "UI GreenMetric World University Rankings" to determine campus sustainability efforts. In general, UI GreenMetric uses a sustainable environment with three components: environmental, economic, and social [1]. Environmental aspects include natural resources, environmental management, and pollution control, where the economic aspects include profit and efficiency. Meanwhile, social aspects include education, community, and social involvement. These three aspects are used as UI GreenMetric criteria. Green campus is an education system, community service research, and an environmentally friendly location and involves campus residents in environmental activities and must positively impact the

environment, economy, and society. In the green campus, there are 6 (six) categories and 39 indicators as a measure in determining the 2019 UI Green Metric World University Ranking, namely; (1) structuring and infrastructure, with 6 categories, (2) energy and climate change, with 8 indicators (3) waste, with 6 indicators (4) water, with 4 indicators (5) transportation, with 8 indicators, and (6)) education and research, with 7 indicators. The mindset of the entire academic community and stakeholders other in implementing the green campus sustainable development policy, according to the research results by [Safrida et al., \[2\]](#), must be supported by improving the quality of life of the university community. Furthermore, the results of [Tiyarattanachai and Hollmann's \[3\]](#) research revealed that stakeholders in the green campus of the University studied were more satisfied and had a significantly better quality of life compared to stakeholders from the non-green campus universities studied. In connection with the quality of life with the application of green campus according to the results of the above research, it is necessary to conduct a study as a variable that supports the policy of implementing a green campus at Muhammadiyah University of Riau. [Marans \[4\]](#) states that quality of life is a concept multi-faceted that may not have a precise definition. It falls between the notions of well-being, contentment, and happiness. the quality of life in an aspect that is attractive to policy makers and urban planners should be called the quality of urban life. The results of the preliminary survey through the assessment of respondents' perceptions of the academic community of Muhammadiyah University in Riau towards 15 indicators of quality of life, found gaps or conditions that were less than ideal than they should be on indicators of quality of life, namely; (1) environmental management has not been formally formatted, (2) the university has not provided sufficient green space to support a high quality of life, (3) the University's energy saving practices have not fully supported a high quality of life, (4) waste management (for example waste separation, waste reduction) as practices that support a high quality of life which is very important for universities have not been well managed, and (5) university environmental education has not supported a high quality of life In implementing green campuses, the quality of life can vary depending on in the context of use. For example, Mayor of London Boris Johnson defined sustainable quality of life for Londoners in 2009 as "The quality of life that Londoners experience while living, working, visiting and moving around London is fundamental to how they feel about the city and how its capital is located. The decisions we make about our cities today will shape the quality of life of the people who come after us and their views on how successful we are in managing our cities [5]. According to The World Health Organization (WHO) defines the term quality of life (Quality Of Life) as an individual's perception of their position in life in the context of the culture and value system

in which they live and in relation to goals, expectations, standards and concerns. It is a broad concept that is influenced in complex ways by a person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to important features of their environment [6]. However, a green university initiative may not be everyone's best wish if universities are not prepared for it. For example, some universities may try to reduce energy consumption by reducing the use of air conditioners. This should be ideal if a green building, designed for natural ventilation and less reliance on air conditioning, is available. Unfortunately, this practice may not be appropriate for buildings not designed for it [7]. Without the right design, people in such a building will not feel very comfortable and happy when the air conditioner is not on. This situation may not result in a good quality of life for stakeholders in the university. Improving the quality of life for the academic community of Muhammadiyah Riau University requires appropriate and relevant policy strategies. SWOT analysis is used to identify the relationship between strategic issues about opportunities, threats / challenges, strengths and weaknesses related to improving the quality of life in implementing green campuses. SWOT analysis is the identification of various factors to formulate a strategy. This analysis is based on logic that maximizes strengths and opportunities, but at the same time minimizing weaknesses and threats. [8]

2 METHODOLOGY

This research uses a mixed methods approach or often referred to as a mixed method. The implementation of mixed methods research combines quantitative and qualitative research methods, using a sequential explanatory strategy. Mixed research is a procedure for collecting, analyzing, and mixing quantitative and qualitative methods in a study or series of studies to understand research problems [9]. This is in line with the opinion of [Johnson & Christensen \[10\]](#) that mixed research is a class of research studies where the researcher mixes or combines quantitative and qualitative approaches. Research data collection is carried out for the purposes of quantitative analysis and qualitative analysis. Data collection for quantitative analysis was carried out through a questionnaire instrument. The questionnaire was given to 100 respondents from the academic community, consisting of; lecturers, staff and students as research samples. Data collection for the purposes of qualitative analysis was carried out by interviewing and methods focus group discussion (FGD) to structural officials at Muhammadiyah Riau University as well as environmental experts and transportation experts, physical observation, and documentation. Quantitative data analysis was carried out by descriptive statistical method, while the qualitative data were analyzed in four stages, namely; first, the data obtained

through interviews in the form of structured and guided questions, analyzed using qualitative descriptive analysis; second, after reducing the interview data, then testing the suitability with the results of descriptive statistics on respondents' perceptions of quality of life; third, the researchers conducted observations of the physical evidence of green campuses, and tested the conformity with indicators of quality of life in the application of green campuses, and fourth, was the last stage in qualitative data analysis, this stage aims to formulate a policy strategy for improving the

quality of life of the community. academics at Muhammadiyah Riau University [11].

3 RESULTS AND DISCUSSION

Research Results

Testing the quality of life with descriptive statistics, obtained an overall result value of 1.74 or in the category Fairly Appropriate, with details as in Table 1, as follows:

Table 1: Level of conformity of quality of life in the application of green campuses at universities Muhammadiyah Riau.

No	Item Statement	Average Value of Respondents' Perception	Interpretation of Value
1	Environmental management is important for campus	1.33	Not appropriate
2	Respondents are satisfied with university environmental management	1.46	Not appropriate
3	Green space available on campus is important for respondent	1.86	Sufficiently Sufficient
4	The campus provides sufficient green space to support a high quality of life	2.14	Sufficiently Sufficient
5	Energy saving is a very important practice for campuses	2.23	Sufficiently Suitable
6	Campus energy saving practices truly support a high quality of life	2.04	Sufficiently Appropriate
7	Greenhouse gas emission reduction program is a yes a practice ng very important for campus	1.44	Not suitable
8	Waste management (eg waste separation, waste reduction) is a very important practice for campus	1.40	Not suitable
9	Campus waste management does support a high quality of life	1.42	Not appropriate
10	Management Campus water (water saving) does support a high quality of life	2.19	Sufficiently Appropriate
11	Conditions of campus transportation (amount of traffic, availability of public transportation, etc.) support high-quality life	1.56	Not Appropriate
12	Education related to the environment on campus (activities related to the environment) do support a high quality of life	1.44	Not suitable
13	Respondents are satisfied with the overall quality of life of respondents on campus	1.79	Sufficiently suitable
14	If the respondent is a university applicant, status green campus will be one of the respondent selection criteria	2.00	Sufficiently Sufficient
15	Green campuses indeed support a high quality of life on campus	1.86	Sufficiently Suitable
	Total	1.74	Sufficiently Appropriate

In order to validate and confirm, the results of the perceptions of the academic community on quality of life indicators in the application of green campuses, then a qualitative research approach was carried out, by collecting data through interviews with structural officials at Muhammadiyah Riau University, namely the Chancellor, Deputy Chancellors 1 and 3, Chair of the Institute for Research and Community Service, Head of Quality Assurance, Head of Student Affairs Academic Administration (BAAK), Head of General Administration and Finance (BAUK), Dean, and Head of Study Programs. The results of the interview, after reduction and data coding, and triangulation testing showed that the achievement in the category Sufficiently Appropriate or the total interpretation value was an average of 50.13%. This is in line with the results of respondents' perceptions of the academic community towards the implementation of a green campus, with a score of 1.74 or the category Fairly Appropriate. The achievement of the total score of the average quality of life in the application of the green campus at Muhammadiyah University, Riau according to the perception of the academic community of 1.74 and the opinion of structural officials of 50.13% or in the category Sufficiently Appropriate of 15 indicators of quality of life have not shown a maximum value, it is even closer to the minimum score that is close to the non-conforming category at the upper limit of the non-conforming score of 1.67 and 49%. Thus, the implementation of a green campus has not been able to improve the quality of life of the academic community. Achievement of inappropriate indicator scores, namely: (1) environmental management is important for campus, (2) greenhouse gas emission reduction programs are very important practices for campuses, (3) waste management (e.g. waste separation, waste reduction) is practices that are very important for the campus, (4) campus waste management does support a high quality of life, (5) the

condition of campus transportation (the amount of traffic, availability of public transportation, etc.) supports a high quality life, and (6) related education environment on campus (activities related to the environment) do support a high quality of life. In order to improve the quality of life, policy strategy formulation is then carried out through focus group discussions (FGD). The formulation of strategies for improving the quality of life of the academic community with a SWOT analysis uses the model External Factor Analysis Situation (EFAS) to identify opportunities and threats or challenges, and Internal Factor Analysis Situation (IFAS) to identify strengths and weaknesses, through four stages, namely; first, determining strategic issues related to the external environment for opportunities and threats in economic, social, cultural, environmental, political and technological aspects; second, based on the results of respondents' perceptions of the indicators of quality of life in the application of green campuses, and the results of confirmation of the validity of perceptions through interviews and physical observations determined strategic issues of internal factors; third, according to the results of the determination of strategic issues of internal and external factors, then the scores in EFAS and IFAS are determined, as well as the combined strategy of TOWS, namely a strategy that uses strength to take advantage of opportunities, (2) strategies that minimize weaknesses to take advantage of opportunities, (3) strategies that use strengths to overcome threats, and (4) strategies that minimize weaknesses and avoid threats; and, fourth, is the final work step in the formulation of a policy strategy for improving the quality of life of the academic community at Muhammadiyah University, Riau. The results of the FGD with related parties, obtained strategic issues, weights, ratings and scores of external and internal factors, using External Factor Analysis Situation (EFAS), and Internal Factor Analysis Situation (IFAS) as in Table 2, below;

Table. 2 External Factor Analysis Situation

No	Strategic Issue	Weight	Rating	Score
I	OPPORTUNITY			
1	Attraction as a green campus	0.20	4	0.80
2	Increased new student admissions	0.20	4	0.80
3	Best ranking UI Green Metric	0.10	3	0,30
	Total Opportunities	0.50		1.90
II	THREATS			
1	The growth of buildings around the UMRI campus	0.20	3	0.60
2	High growth of vehicle traffic	0.20	3	0.60
3	The growth of human activities around the campus is high	0.10	2	0.20
	Total Threat	0.50		2.70
	Total		1.00	
			4.60	

Table. 3 Internal Factor Analysis Situation

No	Issues	Weight of	Rating	Score
I	STRENGTH:			
1	Availability of green space	0.20	4	0.80
2	Savings e	0.15	3	0.45
3	Campus water management	0.15	2	0.30
	Total Strength	0.50		1.55
II	WEAKNESS			
1	Campus environmental management	0.20	4	0.80
2	Reducing greenhouse gas emissions	0.10	3	0.30
3	Waste treatment	0.10	4	0.40
4	Condition of campus transportation	0.05	3	0.15
5	Education related to the environment on campus	0.05	3	0.15
	Total Weakness	0.50		1.80
	Total		1.00	3.35

Table 2 and 3 above explain that the value of the external factor score of 4.60 is greater than the internal factor score of 3.35, which indicates there are more opportunities to improve the quality of life of the academic community in the application of a green campus. However, Threat with a score of 2.70 is greater than the opportunity score of 1.90, and the weakness with a score of 3.35 is greater than the strength score of 1.55. This shows the existing condition of the quality of life of the Muhammadiyah University academic community in the application of a green campus

in a weak internal position and high external threats. In accordance with the results of the EFAS and IFAS, the next stage is analyzed in the combined strategy of TOWS (Threat, Opportunity, Weakness, and Strength), namely; (1) strategies that use strengths to take advantage of opportunities, (2) strategies that minimize weaknesses to take advantage of opportunities, (3) strategies that use strengths to overcome threats, and (4) strategies that minimize weaknesses and avoid threats, as in table 4, following:

Table 4: TOWS Matrix

IFAS	Strength (S)	Weakness (W)
	1. Availability of open space	1. Campus environmental management
	2. Energy savings	2. Reducing greenhouse gas emissions
	3. Campus water management	3. Waste treatment
		4. Related education environment on campus
		5. Campus transportation conditions
EFAS	STRATEGI SO	STRATEGI WO
Opportunities (O)		
1. Attraction as a green campus	1. Formed a green campus management system task force	1. Formulated an environmental management system campus
2. Increased acceptance of new students	2. Formed an ad hoc UI green metric committee	2. Recruitment of environmental experts
3. Best ranking UI green metric	3. Formed a green campus promotion team	3. Formulating models for reducing greenhouse gas emissions
		4. Formulating models of processes of waste
		5. Formulating a green campus training curriculum

		6. Formulating a campus transportation management mode
	STRATEGI ST	STRATEGI WT
Threat (T)		
1.High growth of buildings around the UMRI campus	1. Increasing the number of plants in green open spaces	1. Forming a team with tasks specifically to deliver material about green campuses
2.High growth in vehicle traffic		2. Reducing the use of motorized vehicles
3.The growth of human activities around the campus is high		

Based on the TOWS analysis above, then a policy strategy is formulated to improve the quality of life of the academic community at Muhamaddyah Riau University, as in table 5, as follows:

Table 5 Policy Strategy Matrix for Improving the Quality of Life of Civitas Academics at Muhamaddyah University Riau

Policy	Action Plan
1. Improvement of campus environmental management system	1. Recruitment of environmental experts 2. Preparation of environmental friendly campus management manuals at UMRI green 3. Preparation of campus-based campus master plans
2. Improvement of green campus organizational system	1. Establishment of green campus committee 2. Establishment of adhoc committee UI Green Metric 3. Establishment of green campus promotion team Green
3. Improvement of Building and Open Space	1. Planting green plants 2. Reducing greenhouse gas emissions
4. Improving waste processing infrastructure	Construction of integrated waste processing facilities (TPST) for garbage disposal and the processing of waste
5. Improved environmental knowledge	1. Training in environmental science 2. Research in environmental science 3. Seminar on the environment and global warming
6. Reduction of the use of motor vehicles	1. Provision of facilities bicycle parking 2. Formulation governance model parking efishen 3. Provision of shuttle bus

Discussion of Research

1. Policy Improved environmental management system campus policy deficits improve environmental management system campus is described in 3 action plans, namely; (1) recruitment of environmental experts, (2) preparation of an environmentally friendly campus

management guidebook at UMRI, and (3) preparation of a green campus-based campus master plan. Recruitment of environmental experts is based on competence in the field of environmental science, with competency standards referring to in the Decree of the Minister of Manpower of the Republic of Indonesia [12]. The preparation of a guidebook for environmentally friendly

campus management at UMRI refers to best practices in the Attachment to the Decree of the University Chancellor [13]. Environmentally friendly campuses base the management foundation and guidelines on; (a) the basis of the environment, economy, socio-culture and ecological balance; (b) Adequacy of Green Open Space; (c) waste and waste management; (d) energy management and climate change; (e) water use management; (f) management of the use of transportation and arrangement of parking facilities; and (g) management for Education, Research and Community Service activities by prioritizing the Green Campus theme. In the green campus-based campus master plan according to regulation of Minister of Public Works [14], there are 6 components of planning and design of open space systems and green systems, namely; (1) public open space system, namely space whose physical character is open, free and easily accessible to the public because it does not belong to certain parties, (2) private open space system, namely space with an open but limited physical character, which can only be accessed by the owner, certain users or parties, (3) private open space systems that can be accessed by the public, namely open spaces belonging to certain parties but accessible to the public and have been dedicated to the public interest., (4) tree systems and green systems, namely tree planting patterns which is spread in public open spaces, (5) landscape Areas of open spaces that are left natural but accessible to the public such as beaches / sea, rivers, slopes / hills, green belt areas, which are green open spaces that function as preservation areas and undevelopable, and (6) arrangement, along the side of the Road Owned Area (Damija).

2. Green Campus Organizational System Improvement Policy The green campus organizational system improvement policy is described in 3 action plans, namely; (1) forming a green campus committee, (2) forming an ad hoc UI Green Metric committee, and (3) forming a green campus promotion team. The initiative to form a viable green campus committee, in the organizational structure of the institution can be linked to the constitution of the Student Union and / or the Environmental Society or become an official legal committee in universities. The chairperson and vice chairperson should also have access to top level management. In order to follow the competence of the UI green metric ranking, in the form of a committee that specifically handles the UI green metric model, and is According to the Indonesian Dictionary, **ad hoc**. **Ad Hoc** everything includes people who are formed or appointed to carry out a goal within a certain period of time and temporary nature (KBBI). P established a green campus promotion team, related to the main task of organizing promotional activities in the form of events about UMRI green campus materials and the environment.

3. Policy for Building Improvement and in Green Open Spaces The policy to increase buildings and open green spaces is outlined in an action plan for planting green plants and reducing greenhouse gas emissions. Green planting activities aim to address the need for better CO₂, and in the context of efforts to green campuses, in open spaces already planted trees, as in table 6, below;

Table 6 Existing List Number of Greening Trees at UMRI Campus

No	Tree Name	Average Size / Height (M)	Total
1	Acacia	3.5	14
2	Bintaro	3	12
3	Ketapang Kencana	2.6	52
4	Ketapang	2	19
5	Mahogany	3	12
6	Guava water	1.8	28
7	Mangga	2	23
8	Kedondong	2	1
9	Kelengkeng	1.8	5

Apart from the greening trees, flowers are planted in pots in the form of pots in the corner of the building area and in each corridor of the building. It is hoped that the environment through the trees and flowers will be able to provide coolness, fresh air and shade for students and other campus residents.

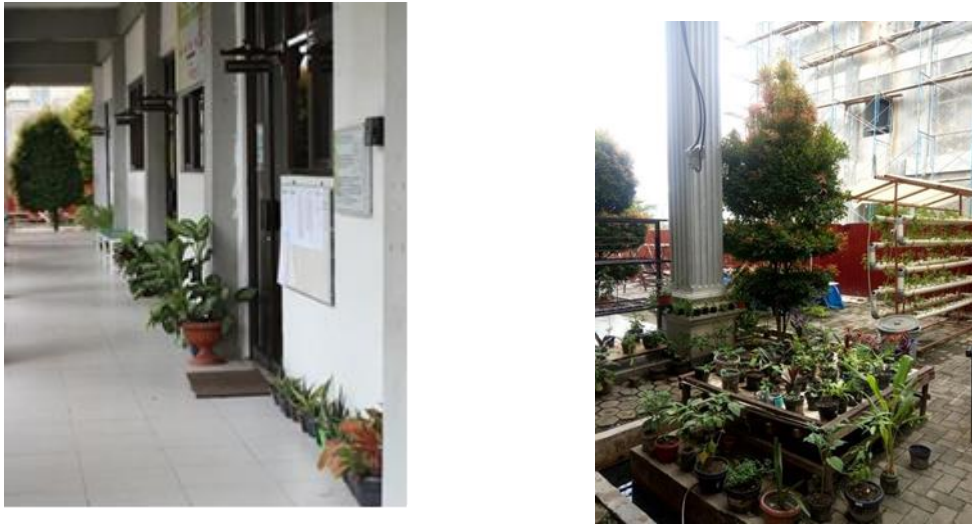


Figure 1. Green Plants in a Pot

Greenhouse gases (GHG) are gases in the atmosphere that function to absorb infrared radiation and help determine atmospheric temperature [15]. Principles To produce an inventory of Greenhouse Gases qualified and ready to be verified is that the principles of transparency, accuracy, consistency, comparable or comparability and completeness or often abbreviated to TACCC. The reduction of greenhouse gas emissions is carried out in the revision and rehabilitation of the building design of the Muhammadiyah University of Riau by reducing the use of glass as a dividing wall or building wall covering.

4. Policy for Improving Waste Infrastructure The waste management Management policy for improving infrastructure is implemented in the action plan for the creation of an integrated waste treatment plant (TPST) for waste disposal and waste processing. Waste is defined as all types of waste and sewage from sewage treatment plants, clean water treatment plants, or control facilities. air pollution and other materials, including solid, liquid, semi-solid, and gas resulting from industrial, commercial, mining and agricultural activities carried out by humans [16]. Furthermore, processing waste, or domestic wastewater treatment, is the process of removing contaminants from waste water and household sewage, both runoff (effluents) and domestic. This includes physical, chemical, and biological processes to remove physical, chemical and biological contaminants. The aim is to produce a waste stream (or effluent treated) and solid waste or sludge suitable for disposal or reuse in

the environment. Integrated waste processing site, hereinafter abbreviated as TPST, is a place where activities for collection, sorting, reuse, recycling, processing and final processing are carried out [17]. The study of waste management with an integrated concept is based on the amount of waste generated from the calculation of material balance, data from research on waste characteristics and the ability of waste managers. The study was carried out on operational technical aspects, financial aspects and institutional aspects [18]. Operational technical aspects, including the waste processing system that will be carried out at PPST, raw materials for waste processing, necessary facilities and infrastructure, container systems, waste collection and transportation from source to PPST. Financial aspects, including the amount of costs required for investment, operation and maintenance as well as income generated from the sale of PPST products. Then carried out a feasibility assessment based on investment criteria such as the Internal Rate Return and Benefit / Cost Ratio. Institutional aspects, including organizational structure, and human resource needs.

5. Environmental Knowledge Enhancement Policy The environmental knowledge improvement policy is described in 3 action plans, namely; (1) environmental science training, (2) environmental science research, and (3) environmental and global warming seminars. Environmental training activities to improve the knowledge and skills of the UMRI academic community in the environmental field. Goldstsein and Gressner

(1988) in Kamil [19] define training as a systematic attempt to master skills, rules, concepts, or ways of behaving that have an impact on improving performance. Furthermore, according to Dearden (1984) in Kamil [19], training basically includes teaching and learning processes and exercises aimed at achieving a certain level of competence or work efficiency. Moekijat [20] specifically stated that the objectives of the training were: (1) developing skills, so that work could be completed more quickly and more effectively; (2) Developing knowledge, so that work can be done rationally; and (3) develop attitudes, thereby creating the ability to cooperate with fellow employees and with the leadership. Training in environmental science or ecology in universities, aims to; (a) increase the understanding of the academic community towards the concept of environmental education in a broad sense, (b) become a means of joint dialogue in environmental education, and (c) become a means of friendship and communication between practitioners, and the academic community in environmental education. Research on environmental material is one way to increase the environmental knowledge of the UMRI academic community. Riset or research is often described as a process of investigation carried out with the active, diligent, and systematically, aiming to discover, interpret, and revise facts [21]. This intellectual inquiry produces a knowledge deeper of events, behavior, theory and law and opens up opportunities for practical application of that knowledge. This term is also used to describe a collection of information comprehensive on a particular subject, and is usually associated with the results of a scientific method. Environmental research means research related to ecology and its ecosystem, especially those related to the UI indicator. green metric ranking seminar is a meeting of a group of people held to be able to discuss a problem and find scientific solutions to the problem. A seminar is a meeting held by a group of people with the aim of being able to discuss a particular topic and finding a solution to a problem by means of question-and-answer interaction. Environment-themed seminars can be started with environmental research activities, which are then held in seminars with stakeholders who are interested in environmental studies, especially green campuses. The seminar activities will indirectly form UMRI's brand image as a green campus.

6. Policy on Reducing the Use of Motor Vehicles The policy to reduce the use of motorized vehicles is described in 3 action plans, namely; (1) providing bicycle parking facilities, (2) providing an efficient parking management model, and (3) providing shuttle buses. Parking facilities in universities have an important role to fulfill the needs

of college residents who use private vehicles as a result of the high level of mobility. Parking facilities are basically locations that are determined as a non-temporary stop for vehicles to carry out activities at a certain time (Director's Decree) [22]. Parking facilities should meet the criteria; [23] (a) the parking space is maintained on a flat surface so that the vehicle does not roll. If the land is sloping, do grading using the system cut and fill, and (b) the parking lot with the building (the place of activity) is made not far away. If it is far enough away, make a clear and directional circulation towards the parking area. From a design point of view, the criteria and principles of a parking space should generally pay attention to; (a) time of use and utilization of parking spaces. For activities that take place at all times, the parking lot needs to be equipped with adequate lighting. Can use garden lights as high as 2 meters or placement of mercury street lights; (b) the number of vehicles to be accommodated so that the estimated area required is known; (c) the size and type of vehicles to be accommodated, (d) safe and protected from the sun's heat, (e) sufficient lighting at night, and (f) supporting parking facilities, such as a driver's waiting area and trash cans. Shuttle is a transportation point to point, from place to place, only departing and dropping off passengers at certain places. The shuttle bus is a small bus which generally has the same base as a small truck, which functions to take passengers from an area that is far from the main route, to a bus station on the main road. The provision of campus shuttle buses can reduce gas emissions, due to a reduction in the use of two-wheeled and four-wheeled vehicles from the UMRI academic community.

4 CONCLUSION

The level of achievement of the average total score against 15 indicators of quality of life in the implementation of green campus at Muhammadiyah Riau University according to the perception of the academic community is 1.74 and the opinion of structural officials is 50.13% or in the category Sufficiently Appropriate. This achievement has not shown a maximum score, even closer to the minimum score that is close to the category inappropriate at the upper limit of the inappropriate score of 1.67 and 49%. Thus, the implementation of a green campus has not been able to improve the quality of life of the academic community. Achievement of inappropriate indicator scores, namely: (1) environmental management is important for campus, (2) greenhouse gas emission reduction programs are very important practices for campuses, (3) waste management (e.g. waste separation, waste reduction) is practices that are very important for the campus, (4) campus waste management does support a high quality of life, (5) the condition of campus transportation (the amount of traffic,

availability of public transportation, etc.) supports a high quality life, and (6) related education environment on campus (activities related to the environment) do support a high quality of life.

In an effort to improve the quality of life of the academic community at Muhammadiyah University, Riau, a policy was formulated as follows:

1. Policy for upgrading the campus environmental management system, outlined in 3 action plans, namely; (1) recruitment of environmental experts, (2) preparation of an environmentally friendly campus management guidebook at UMRI, and (3) preparation of a green campus-based campus master plan.
2. The policy to improve the green campus organizational system is described in 3 action plans, namely; (1) establishing a green campus committee, (2) establishing an adhoc UI Green Metric committee, and (3) establishing a green campus promotion team.
3. Policies for building green open spaces and building improvements are outlined in an action plan for planting green plants and reducing greenhouse gas emissions.
4. Policy to improve waste management infrastructure through an action plan for the creation of an integrated waste processing facility (TPST) for waste disposal and solid waste processing.
5. Policy to increase environmental knowledge is outlined in 3 action plans, namely; (1) environmental science training, (2) environmental science research, and (3) environmental and global warming seminars.
6. The policy to reduce the use of motorized vehicles is described in 3 action plans, namely; (1) providing bicycle parking facilities, (2) preparing an efficient parking management model, and (3) providing shuttle buses.

References

- [1] UI GreenMetric World University Rankings, "Petunjuk UI GreenMetric World University Rankings 2019," :Sustainable University in a Changing World: Lessons, Challenges and Opportunities, 2019.
- [2] Safrida Fatmawati and Sjahbana, "Penerapan Kebijakan Pembangunan Berkelanjutan Di Lingkungan Kampus (Studi Perbandingan Antara Kampus Tembalang Universitas Diponegoro Dan Kampus Tertre Universitas Nantes),"Universitas Diponegoro. Semarang, vol. 11, no. 4 pp. 484-497, 2015.
- [3] R. Tiyyarattanachai, N. Hollmann, "Green campus initiative and its impacts on quality of life of stakeholders in Green and Non-green campus universities,"Tiyyarattanachai and Hollmann SpringerPlus, vol.5, pp.84, 2016.DOI 10.1186/s40064-016-1697-4.
- [4] R.W. Marans, "Quality of urban life & environmental sustainability studies: future linkage opportunities," Habitat International, vol. 55, pp. 45:47, 2015.
- [5] P. Higgins, J. Campanera, A. Nobajas, "Quality of life and spatial inequality in Londo,"Eur Urb Reg Stud, vol. 21, pp. 42-59, 2014.
- [6] World Health Organization, "WHOQOL Measuring quality of life," Programme on Mental Health, vol. 1, 1997.
- [7] University, C. T. (2012) "GREEN CAMPUS INITIATIVE - Green week," Cape Town, 253(Aes 2018), hal. 39-44. Tersedia pada: http://www.greening.uct.ac.za/gci/green_week/.
- [8] Fachrudin, H. T. dan Fachrudin, K. A. (2021) "The relationship between green behaviour and green campus principles: A literature review," IOP Conference Series: Materials Science and Engineering, 1122(1), hal. 012028. doi: 10.1088/1757-899x/1122/1/012028.
- [9] Creswel, W. John, "Research Design: Pendekatan Kualitatif, Kuantitatif, dan Mixed,"Jogyakarta: Pustaka Pelajar, 2013.
- [10] B. Jhonson, L. Christensen, "Educational research Quantitative and Qualitative Approach,"Boston: Allyn & Bacon, 2014.
- [11] Joseph Sirgy, M., Phillips, R. dan Rahtz, D. (2013) Community quality-of-life indicators: Best cases VI, Community Quality-of-Life Indicators: Best Cases VI. doi: 10.1007/978-94-007-6501-6.
- [12] Keputusan Menteri Ketenagakerjaan Republik Indonesia Nomor 109 Tahun 2015 Tentang Penetapan Standar Kompetensi Kerja Nasional Indonesia Kategori Jasa Profesional, Ilmiah Dan Teknis Golongan Pokok Jasa Arsitektur Dan Teknik Sipil; Analisis Dan Uji Teknis Pada Jabatan Kerja Ahli Teknik Lingkungan Bidang Jasa Konstruksi.
- [13] Lampiran: Peraturan Rektor Universitas Sebelas Maret Nomor : 827A/UN27/KP/2013 Tanggal: 20 September 2013 Pedoman Pengelolaan Kampus Ramah Lingkungan Universitas Sebelas Maret.
- [14] Peraturan Menteri Pekerjaan Umum Nomor: 06/PRT/M/2007 .Pedoman Umum Rencana Tata Bangunan dan Lingkungan. Direktorat Jenderal Penataan Ruang Departemen Pekerjaan Umum
- [15] Kementerian Lingkungan Hidup, 2012. Pedoman Penyelenggaraan Inventarisasi Gas Rumah Kaca Nasional Buku I. Pedoman Umum Kementerian Lingkungan Hidup.
- [16] Kusyanto, "Manajemen Lingkungan,"Jakarta: PT. Agung Persada, 2012.
- [17] Peraturan Menteri Pekerjaan Umum Republik Indonesia Nomor 03/PRT/M/2013 Tentang Penyelenggaraan Prsarana Dan Sarana Persampahan Dalam Penanganan Sampah Rumah TanggaA Dan Sampah Sejenis Sampah Rumah Tangga.
- [18] S. Raharjo and L. Susanti, "Kajian Penerapan Konsep Pengolahan Sampah Terpadu di Lingkungan Kampus

- Universitas Andalas,” Prosiding SNSTL I, 11 September 2014, pp. 202.
- [19] A. Kamil, 2010.,”Manajemen Diklat,”Semarang: Pusaka Press
- [20] Moekijat, 2012. Manajemen Sumber Daya Manusia. Yogyakarta: Mandar Maju.
- [21] Suhatman.D, 2013. Metode Penelitian Ilmiah, Pendekatan Kuantitatif dan Kualitatif. Jakarta: Sumber Ilmu
- [22] Sholihin, M. Y. M., Prasetyani, R. dan Mukti, B. C. (2020) “Analysis of the impacts of Motor Vehicle Exhaust Emissions at Pancasila University on health in order to create A Green Campus,” IOP Conference Series: Materials Science and Engineering, 847(1). doi: 10.1088/1757-899X/847/1/012042.
- [23] Keputusan Direktur Jenderal Perhubungan Darat Nomor.272/HK.105/DJRD/96, 1996 , tentang Pedoman Teknis Penyelenggaraan Parkir.