Logic Scoring of Preference Development Training New Urban Agenda for Ready to Build Areas and Environment

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ABSTRACT
Sustainable development (SDGs) point 11 implies that the urban and community development agenda is carried out by building quality, safe and sustainable cities and settlements. The facts on the field of development of ready-to-build areas and environments ignore the principle of SDGs point 11. The purpose of developing the logic scoring of preference for the new urban agenda for ready to build area and environment is to increase the capacity of Civil Engineering in realizing sustainable development in determining disaster mitigation Ready to Build Areas and Ready to Build Environments as an early warning disaster. This is directly related to the professional competence that Civil Engineering graduates must have as urban designers. This method begins with an explanation of material regarding the logic scoring of preference and ready-to-build areas.

Keywords: *Civil Engineering, Logic Scoring of Preference, New Urban Agenda, Ready to Build Area and Environment*

1. INTRODUCTION

In recent decades, the world's large urban areas have faced the problem of balancing between urban growth and considering environmental characteristics [1]. Urban areas are a means of accelerating regional economic development [2]. So that makes the city an important thing and in the regional economic system. The facts on the ground show Fulfillment of housing needs encourages private entrepreneurs to control and build in a scattered and uncontrolled manner which has an impact on environmental disasters. Disaster mitigation in the development of ready-to-build environmental areas that ignore the principles of SDGs point 11 (Inclusive, safe, resilient, sustainable) [3]. In addition, the land acquisition process required for the construction of housing complexes or settlements generally takes quite a long time. This condition is used by land speculators to preempt housing entrepreneurs from buying land from owners without following procedures set by the government [4]. This has resulted in high housing prices, scattered housing developments and regardless of the carrying capacity of the environment. In an effort to overcome the practice of implementing this kind of development, including controlling land prices and house prices, so as to avoid quite complex problems in the future. The government strives for residential areas in urban areas that meet the requirements as ready-to-build areas and environments [5]. To meet the challenges of urban sustainability, urban land needs to be evaluated spatially with an interdisciplinary approach that integrates ecological, economic, social and design/planning sciences [6].

Urbanization is a phenomenon of changing the characteristics of an area marked by population growth [7]. This urbanization phenomenon occurs not only in Indonesia but also in cities in the world. Data from the United Nations states that in 2014, 54% of the population lived in cities and will continue to increase until it reaches 66% in 2050[8]. In Indonesia alone, in 2015 more than half of Indonesia's population lived in cities rather than in villages and this trend is expected to continue until 2035 where it is projected that around 67% of Indonesia's population will live in cities [6]. The phenomenon of urbanization can be used as an opportunity to drive regional and national economies as well as to improve people's welfare.

New Urban Agenda (NUA) is a global commitment in accordance with the agreement drawn up by delegates

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from 140 countries including Indonesia [3]. The aim of the New Urban Agenda is to realize sustainable urban development [4]. The New Urban Agenda seeks to encourage action at the local level in addressing development challenges, particularly those that arise with increasing urbanization [9]. This global commitment can be used as a guide for urban development stakeholders and actors at the national and local levels, so that it can then be translated into development plans for each region. In addition to the New Urban Agenda (NUA), there are several global development commitments that have been agreed upon by Indonesia. One of them is the commitment to the Sustainable Development Goals (SDGs) [10]. The Sustainable Development Agenda or Sustainable Development Goals (SDGs) as a global development agreement contains a set of transformative goals that are agreed upon and apply to all nations without exception [11]. The five main foundations of SDGs are people, planet, welfare, peace, partnership which are divided into 17 SDGs goals [2]. The concept of sustainable development has long been the concern of experts. However, the term sustainability only appeared a few decades ago. Sustainable development is a human effort to improve the quality of life while still trying not to go beyond the ecosystems that support life [8]. The issue of sustainable development has been made an important issue that needs to be continuously socialized in society.

Figure 1 Sustainable Development Goals [8].

New Urban Agenda (NUA) and the Sustainable Development Goals (SDGs) have a very close relationship, because the New Urban Agenda is a further elaboration of the global goals listed in the SDGs, especially goal 11 regarding Sustainale Cities and Communities.

Figure 2 Goals of SDGs Sustainable Cities and Communities [12].

- **Targets 11-3.** By 2030, strengthen inclusive and sustainable urbanization, as well as capacity for participatory, sustainable and integrated settlement management planning in all countries.

- **Targets 11–4.** Strengthen efforts to protect and maintain world cultural heritage and world natural heritage.

- **Targets 11-6.** By 2030, reduce the adverse per capita urban environmental impacts including by paying special attention to air quality, including handling of municipal solid waste.

- **Target 11-B.** By 2030, increase the number of cities and settlements that adopt and implement integrated policies and plans towards inclusion, resource efficiency, climate change mitigation and adaptation, disaster resilience and building and implementing holistic disaster risk management at all levels which is in line with the Sendai framework for disaster risk reduction 2015 – 2030.

2. METHOD

This article was prepared based on research results using the logic scoring preference method. LSP is one of the multi-criteria evaluation methods in decision-making that can provide valuable references in spatial planning.The three main steps in LSP are: (1) Develop attribute trees, (2) Define elementary attribute criteria and (3) Develop logical aggregation structures. The LSP method utilizes geospatial datasets that contain social, economic and environmental data to evaluate land capability or suitability for agriculture [13].

In general, new urban agenda scoring preference logic training for ready-to-build areas has the benefit of fostering the enthusiasm of Civil Engineering students in increasing their performance capacity as professional engineers, especially through capacity development in determining Ready-to-Build Areas and Ready-to-Build Environments. This activity uses a descriptive approach through online and offline face-to-face activities, discussions, workshops and training. The methods used in this training are discussion, demonstration, and performance methods. This method begins with an explanation of material regarding the logic scoring of preference and ready-to-build areas. Furthermore, the training participants are given the opportunity to determine the area ready to build using spatial analysis and ends with evaluating the implementation of training activities. The expected indicator of success in this training activity is that training participants can increase their decision-making capacity in determining ready-to-build areas as a new urban agenda using the logic scoring of preference method.

3. RESULTS AND DISCUSSION

3.1. Development concept of logic scoring of preference for new urban agenda for ready-to-build areas.

PenArea-based settlement development is planned to be more effective, directed and sustainable. Ready-to-Build Areas and Ready-to-Build Environments are strategic areas in the context of efforts to distribute development and provide settlements. Determination of ready-to-build areas has an effect on urban development. As a new growth pole, the ready-to-build area is an area delineated in the City Spatial Plan [14].Regionalso aims to accommodate the needs of mature plots of land along with houses with balanced, planned and affordable housing patterns for all levels of society [10]. Ready to build areamust be carried out in large-scale residential neighborhoods that have been integrated with urban spatial planning to address the problem of sub-optimal infrastructure provision, poor sanitation, and uncontrollable land prices [3].

The design of the new urban agenda LSP conceptual model for ready-to-build areas that are in accordance with the carrying capacity of the environment as well as the planned rules and regulations is the first step topedevelopment of large-scale residential neighborhoods in Indonesia that have not been carried out in an integrated manner with urban infrastructure.

Environmental data used as input for the design of the new urban agenda LSP conceptual model for ready-to-build areas that are in accordance with the carrying capacity of the built environment using satellite imagery and DEM (digital elevation model) are data: (1) land capability, (2) land suitability of area functions (3) land suitability of residential areas, (4)land price, (5) land availability, (6) population density, (7) population growth, (8) transportation, (9) road network, (10) urban infrastructure (water, electricity, gas and sewage), (11) health services, (12) educational services, (13) commercial services and (14) green spaces.Evaluation of environmental aspects is directed to determine the potential of the land for the development of ready-to-build areas. The condition of the environmental aspect which includes 14 criteria is used as input to obtain the output of land suitability class maps for ready-to-build areas from the results of the digital spatial analysis process using ArcGIS 10.2. The development of a class map model for conformity evaluation of ready-to-build areas that are in accordance with the carrying capacity of the environment as well as rules and regulations are analyzed using the LSP method.The integration of land evaluation and GIS can provide a better basis for addressing the spatial suitability of land. Also, process analytic as a multi-criteria decision-making approach to arrive at a preference scale among a set of alternatives [5]. Application of existing GIS-based MCE methods in agricultural land suitability evaluations is rarely able to incorporate a greater number of diverse criteria (more than 10 criteria) and address the broader logic of human decision-making [6]. Multi criteria evaluation (MCE) is a decision support aspect, which in the context of GIS based decision making has been projected as a useful method for solving problems in spatial management and also a powerful approach for land suitability evaluation [7], [8]

The Logic Scoring of Preference (LSP) method was developed to provide a component that can better overcome this deficiency using soft computational logic operations of conjunction/disjunction, hard and soft partials and conjunctive/disjunctive partial absorption, human reasoning more closely represented [15].The Logic Scoring of Preference (LSP) method is an evaluation of computer systems and an illustration of the multi-criteria method introduced in the early 1970s. The basic math LSP method is based on the general conjunction/disjunction of soft computing concepts. Nonlinearity is the LSP method's main advantage in consistency with the observational property of human reasoning evaluation[15]. The three main steps in LSP are: (1) Develop attribute trees, (2) Define elementary attribute criteria and (3) Develop logical aggregation structures. The LSP method utilizes a geospatial dataset that contains social, economic and environmental data to evaluate land capability or suitability for agriculture [3].

3.2. Improvement of the cognitive, affective, psychomotor domains of activity participants

The results of observations during eight meetings can be concluded that the increase in aspects of the cognitive, affective, psychomotor domains of activity participants with the material logic scoring of preference for the new urban agenda for ready-to-build areas can go well. This is viewed from the level of understanding, with this model the material can be better understood, more interesting, fun and not boring because of the logic scoring method of preference for the new urban agenda for ready-to-build areas.

Aspects of skills in operating Google earth and GIS software are generally quite good. This can be seen from the results of the pre-test and post-test which show that there is an increase in the capacity of the participants regarding the logic scoring of preference for the new urban agenda for ready-to-build areas.

The average pre-test value of 76 respondents on increasing the capacity of the logic scoring of preference for the new urban agenda for ready-to-build areas before being given treatment is with an understanding level of not understanding with a total percentage of 6%, sufficient understanding of 4%, understanding of 61% and very understanding 26%. The level of understanding of the respondents is depicted in Figure 3.

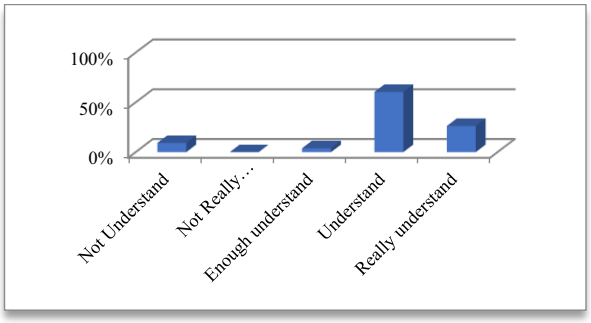

Figure 3 Level of Understanding Pre-Test Development Evaluation of Green Building.

The average post test score of 76 respondents on increasing the capacity of the logic scoring of preference for the new urban agenda for ready-to-build areas after being given treatment experienced an increase in understanding, there were no more participants who felt they did not understand the material. Participants with sufficient understanding were 22%, understood 57% and really understood 21%. The level of understanding of the respondents after being given treatment is depicted in Figure 4.

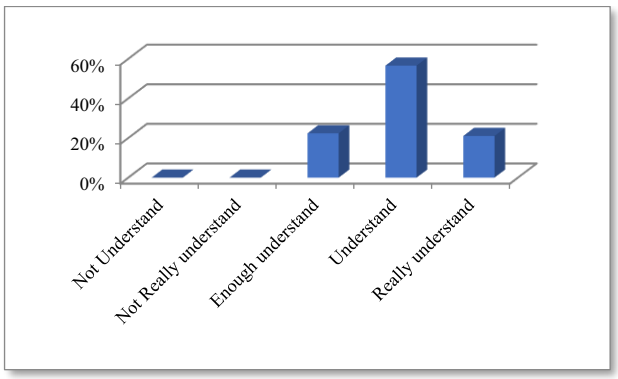

Figure 4 Post Test Understanding Level of Green Building Evaluation Development.

Based on the explanation above, it can be concluded that the level of respondents' understanding of the logic scoring of preference for the new urban agenda for ready-to-build areas has increased, as illustrated in Figure 5.

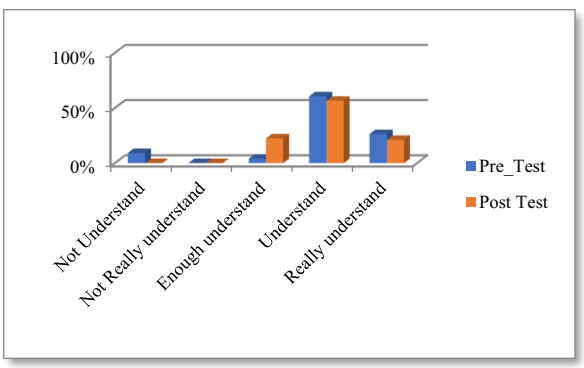

Figure 5 Comparison of Understanding Level of Green Building Evaluation Development.

Comparison of Pre-Test and Post-Test Results with the Paired Sample T-Test

Based on the results of the analysis a conclusion can be drawn. The average result of the pre-test, namely before being given the treatment, was 71.90, while the average post-test, namely after being given the green building evaluation learning treatment, was 73.28. The results of the two studies differ quite a lot (significantly) as described in table 1.

Table 1. Paired Samples Statistics

		Means	N	std. Deviation	std. Error Means
Pair 1	VAR00002	71.9079	76	24.01343	2.75453
	VAR00003	73.2895	76	10.81828	1.24094

Table 2 Paired Samples Correlations explains the correlation values which show the relationship between the two variables in paired samples. This is obtained from the bivariate Pearson correlation coefficient (with a two-tailed significance test) for each pair of variables included.

Table 2. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	VAR00002 & VAR00003	76	.463	.000

Besides being able to obtain the results of the analysis from the average sample value, it can also be obtained from the t value in the Paired Sample T-test table by comparison with the t table.The significance value (2-tailed) is 0.000 ($p < 0.05$). So that the results of the pre-test and post-test experienced a significant (meaningful) change. Based on descriptive statistics, the pre-test and post-test values are proven to have higher post-test scores.

The results of data processing can be seen that the number of respondents as many as 76 people. In calculating the results of civil engineering capacity building there is a very significant difference between the pre-test and post-test which shows that there is an increase in understanding before being given the logic scoring of preference material for the new urban agenda for ready-to-build areas and after being given the material.

4. CONCLUSION

Based on the results and discussion of the research, several research findings that can be concluded regarding the level of understanding of respondents in analyzing the logic scoring of preference for the new urban agenda for ready-to-build areas is that the implementation of appropriate standard operating procedures to explain the logic scoring of preference for the new urban agenda for ready-to-build areas building can increase the capacity of

Civil Engineering. Implementation of an appropriate flowchart model to explain the logic scoring of preference for the new urban agenda for ready-to-build areas can increase respondents' understanding in a practical, simple, fast and precise manner. Implementation of an appropriate audio-visual model to explain the logic scoring of preference for the new urban agenda for ready-to-build areas that is procedural, practical, fast and precise can increase the capacity of Civil Engineering.

AUTHORS' CONTRIBUTIONS

The author conducted a research study on the logic scoring of preference for the new urban agenda for ready-to-build areas and participated in the alignment of the sequence and preparation of the manuscript. All authors read and approved the final manuscript.

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