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The Decision-Making in Planning of Housing on Musi Riverbank, Palembang

Pengambilan Keputusan dalam Perencanaan Perumahan di Tepi Sungai Musi, Palembang

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Abstract: The riverbank has a unique landscape and socio-cultural character of the community. The area is the transition of the innerland and river ecosystem. The ecological function is very important for balancing the both ecosystems. The Living activity of dwellers creates a socio-cultural bond to the river. This study plans the housing riverbank with a socio-ecological approach. The approach considers the sustainability of the ecosystem and social culture of the dwellers. The research was conducted in Palembang, a big city in Indonesia that has evolved in wetlands on the riverbanks. The current development eliminates the character of the physical and socio-cultural landscape. This study uses the Multi-Attribute Utility Theory (MAUT) method which is part of the Multi-criteria Decision-Making (MCDM) method. MAUT can determine alternative planning through attribute assessment by predetermined objective criteria. The decision making is based on the assessment by experts from various fields. It shows the best alternative depends on the attribute level of the house type. The attribute value is very dominant compared to other attributes. Environmental attributes quite influential are the size of the buffer zone and the construction of riveredge wall. The best alternative result indicated that the planning should accommodate the activities of residents who interact closely with the sustainability of river ecosystems.

Keywords: Urban Housing Riverside, Wetland Ecosystem, Multi-Criteria Decision-Making

Abstrak: Kawasan tepi sungai memiliki keunikan bentang alam dan karakter sosial budaya masyarakat. Daerah ini terletak di peralihan antara daratan sungai. Fungsi ekologisnya sangat penting sebagai keseimbangan dua ekosistem di sisinya. Pemukim tepian sungai membentuk sosial budaya berupa kegiatan sehari-hari yang bergantung pada sungai. Pengembangan permukiman di kawasan tersebut perlu direncanakan dengan pendekatan sosio-ekologis. Pendekatan ini mempertimbangkan keberlanjutan ekosistem dan sosial budaya pemukim. Penelitian dilakukan di Palembang, kota besar di Indonesia yang tumbuh dan berkembang di lahan basah di tepi sungai. Pesatnya pembangunan seringkali menghilangkan karakter bentang alam fisik, dan sosial budaya kawasan tepian sungainya. Penelitian ini menggunakan metode Multi-Attribute Utility Theory (MAUT) yang merupakan bagian dari metode Multi-criteria Decision-Making (MCDM). MAUT dapat menentukan alternatif perencanaan melalui penilaian atribut dengan kriteria objektif yang telah ditentukan. Penilaian tersebut berdasarkan pendapat para ahli dari berbagai bidang. Para ahli menilai berdasarkan pengalaman dan pengetahuan mereka. Hasil penelitian menunjukkan bahwa alternatif terbaik tergantung pada pilihan atribut tipe rumah. Nilainya sangat dominan dibandingkan dengan atribut lainnya. Atribut lingkungan yang cukup berpengaruh adalah ukuran zona penyangga dan jenis konstruksi bantaran sungai. Hal ini menunjukkan bahwa perencanaan permukiman tepi

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sungai harus mengakomodasi aktivitas penduduk yang berinteraksi erat dengan kelestarian ekosistem sungai.

Kata kunci: Permukiman Perkotaan Tepian Sungai, Ekosistem Lahan Basah, Pengambilan Keputusan Multikriteria

INTRODUCTION

The development of housing riverbanks requires a concept to maintains social, environmental, and economic aspects in a harmonious balance. The planning should maintain the ecosystem values related to water resources to support urban life, the scenery formed, and also the heritage value (McInnes, Ali, & Pritchard, 2017). It aims to be solution for ecosystem problems, preserve cultural heritage, manage water, and conserve energy resources. The process begins by understanding the ecological functions and socio-cultural of communities. It maintains the bond of the ecosystem with the community's livelihood. The authentic characteristics indicated by houses on stilts, local community activities, and indigenous culture (Pritchard, 2018) (Dhabhalabutr, 2020). The ecosystem challenge by limitation land, material use, building technology, socio-cultural conditions, and the carrying capacity of the environment makes a unique landscape (Davidson et al., 2019).

The recommendation for housing development should consider from various multidisciplinary fields (Shafaghat, Ghasemi, Keyvanfar, Lamit, & Ferwati, 2017). The riverbank zone is in the transition between built-up land and rivers. It services provide the water purity of city. The riverbanks maintain water by blocking sewage, absorbing waste, and purifying water before returns to river. It also absorbs water to keep river overflow away from city innerland. The ecosystem provides various food and fisheries resources. Ecosystem sensitive of distrube from development that reduces the ecosystem function. The awareness in several countries rise restoration and improvement of the quality of riverbank ecosystems. Total conservation to no building area on riverbank contrary to the requirement of city expansion for build area. Moreover, almost all the riverbanks have been inhabited since the city began. The communities adapt to the nature ecosystem setting to inhabitat in the riverbank (Prescott & Ninsalam, 2016). Daily activities of the community create a river-bound culture (Oktarini, 2020).

Palembang is a riverside city where flat lowlands crossed by hundred rivers. The height of the land is only about 3-4 meters above sea level. River overflow through a flat topography inundated city land created wetlands or swamps. Daily tidal as well as monthly and yearly flood inundated the riverbank. Communities live with adaptation to the landscape conditions by creating building technology, daily livelihoods that depend on the sustainability of the river ecosystem. Raft and stilts houses stood along the banks approach river until near to the boats path. Dwellers work as fishermen, farmers, and traders. The rivers play an important role in the community' lives. The bound maintain sustainability humans and nature. Currently, the swift orientation of development to inner land distrubes the river-bound. The community lesser depend on rivers as natural resources of the daily needs. Many dwellers fill up the land to reclaim the wetland into dry land. Modern city life prefers a more controlled ecosystem than wetland.

This study aims to make decisions for the housing planning on Musi River banks with a socio-ecological approach using a decision-making method that involves many experts. This study decision making uses the MAUT method which has a consistent basis of assessment that considers solutions for integrated problems and conflicting interests (BuHamdan, Alwisy, Bouferguene, & Al-Hussein, 2019). MAUT approach is based on utility theory devoted to assessment techniques and elicitation procedures (Alberti & Cavalcante, 2022). The MAUT method is a multi-criteria decision-making method (MCDM) that has been widely used in the housing sector. MAUT is also used to evaluate the design of residential units to increase profits. The method is also used for accurate environmental evaluation (Alberti & Cavalcante, 2022). The decisions are calculated through the assessment of certain criteria attributes.

METHODS

The Identification collects expert opinion by questionnaires. The experts were selected from those who are familiar with local housing issues of Musi River Bank, Palembang. In addition, the selection of experts is also determined on experience in the field of riverbank construction for a minimum of 5 years. This study gathered 10 participating experts to provide their opinions. The amount is sufficient to represent the analysis data (Jansen, 2011). The experts consisted of two from local government, two architecture practitioners, three city planners, and three academics in the field of urban design. The separate assessments are carried out over one week. MAUT includes many models and techniques that provide a formal basis for describing or choosing alternatives where the consequences are characterized by several relevant attribute values. MAUT is a development method of identifying axiomatically appropriate functional forms of a model derived from behavioural assumptions about utility preferences. Assessment with MAUT has been developed with many models and procedures to support decision-makers in finding more informative trade-off decisions. This study uses the following steps:

1. Defining alternatives and value-relevant attributes

The research attributes and level of attributes are prepared through literature elaboration and field observations about the conservation of riverfront wetland ecosystem services. A preliminary survey was conducted to get input from several perspectives and continued with interviews through in-depth discussions to define the criteria of the objective in opposite interests. The set attributes and levels were selected, reviewed, and revised by a group of experts. The filtering process decides on the last set of goals and attributes. Each attribute and level of the attribute represents certain criteria related to both interests (see Table 1, Column 1 and 3).

2. Evaluate each alternative separately on each attribute

MAUT assesses expert opinion on a problem by measuring their feelings and logics in responding to a problem. Therefore, the expert selection processes must be carried out carefully. The initial assessment framework is formulated quantitatively by giving a rating for each attribute level in order to measure the results of the expert opinion assessment. It

is useful for the development index of ecosystem service conservation that is calculated as utility value. Data collection was carried out through questionnaires on a likert scale of 1-10.

3. Assigning relative weights to the attributes

The next step is to assign relative weights to the attributes called weight. The weight shows the magnitude of the effect of attributes. Assigning the relative weight indicates the differences between the worst and the best level that contributes most in overall value. The extent of the value difference between attributes is assessed by assigning a score to the relative significance of the range compared to the most important range. The weight is shown in percentage number to compare the effect of the overall attributes.

4. Aggregating the single-attribute evaluations and performing sensitivity analyses to make recommendations

The process of identifying housing is assessed based on the combined effect of the attribute value and weight called Single-attribute utility (SAU). It is to aggregate the weights of attributes and the single-attribute evaluations of alternatives to obtain an overall evaluation of alternatives. In the last step of the procedure, sensitivity analyses are carried out to evaluate the stability of the results. After SAU and weight is calculated, the next process is to calculate Multi-Attribute Utility (MAU); therefore, the MAU is an accumulation of the four SAU level attributes. It is assumed that the alternative with the highest overall evaluation will be chosen. It can be concluded that alternative housing with the highest MAU is the best alternative according to the criteria. The MAUT method calculates MAU alternative house as an increase from the SAU constituent (Jansen, 2011).

RESULT AND DISCUSSION

Determination of criteria is the first step of the MAUT method stage. The assessment criteria are compiled through summaries and conclusions from the literature study. Determination of criteria is the first step of the MAUT method stage. Wetlands along riverbanks serve as high value hydrological and biogeochemical ecosystem services. It is important ecosystems for conservation of environmental functions such as flood control, water purification, and nourish of biological habitats. The development often replaces natural wetlands into urban built areas. These developments transform the ecosystem from wetland into dry land. Riverbank conservation is not only ecologically beneficial but also socio-cultural (see Table 1).

Table 1. List of Attributes, Levels Attributes, and Criteria

Attributes	Criteria
House type	Appropriate architectural character of the wetlands on Musi Riverbank Strengthens riverbound socio-cultural activities No disturbing the natural topography of the riverbank wetlands No blocking the flow and ebb of the river Effective in the use of the land area of the built area
Buffer zone width	Develop social, cultural, and economic activities of riverbank community Create an interactive and easily accessible waterfront area Introduce of the city's riverbank landscape

Attributes	Criteria
	Develop in a safe flooding area Provide natural wetland areas No obstacles to river bank flow
River edge wall	Create an interactive, accessible, and live waterfront Open access, both visually and physically, along the river Conserve the natural topography of riverbank
Riverside open space	Develop social, cultural, and economic activities of riverbank community Create an interactive and easily accessible waterfront area Provide recreation areas, culture, and Introduce of the city's riverbank landscape Conserve the natural topography of riverbank Introduce of the city's riverbank landscape Reduce barriers to flow and natural absorption of ecosystem

The assessment results show the weight, attribute level, and SAU. The Weight represents the effect of the attribute on the planning objectives. The type of house has the height point of the attribute weight which means the most attribute to consider. The results show that the type of house has the highest and lowest attribute values. It has a very significant influence to alter planning to the social-ecological objectives. More than half the consideration attainment is determined by the choice of the house type attribute. The second considerable attribute is river bank construction. While on the river edge wall, one of the choices becomes the highest value which shows the influence on the planning objectives. It has a major influence on transforms of the riverside landscape to gain the planning goal. In the open space option, all the values for each level attribute are high, but not significantly different values for the different level attribute. All level attributes have a good influence on the social ecological approach. Meanwhile, the widest buffer zone has a very low value, but the narrowest has a low value too. (See Table 2 Column 2).

Table 2. Attribute Values

Attribute	Weight	Attribute levels	Attribute values	Single-Attribute Utility (SAU)
House type	55.57%	Floating house	7.87	4.37
		Stilt row house	6.87	3.82
		Apartment	4.13	2.30
Buffer zone width	17.38%	0-10 m	6.13	1.07
		11-20 m	6.87	1.19
		21-30 m	6.60	1.15
		>30m	5.7	0.99
River edge wall	22.88%	Natural	6.13	1.40
		Polder	6.80	1.56
		Riverfront Platform	7.67	1.76
Open space type	4.16%	Green space	7.08	0.29
		Park	7.24	0.30
		Playground	7.36	0.31

The identifying process starts the assignment of the alternative planning by evaluating each attribute level separately. The attribute value shows the suitability of each attribute level on the objective of the criteria (see Table 2, Column 4). The important criterion is related to the architectural character in the harmony of the Musi River bank. The house type measures criteria to strengthen the local architectural character and land use. It is related to land cover, water flow resistance, and the infiltration capacity of riverbanks. The mass of the building and the type of foundation of the house has several effects on land cover. The construction of buildings that cover less land is better for ecosystem services. Living on the banks of rivers is faced with the risk of flooding and overflows. Modification of construction or buildings at a safe distance from the riverbank can reduce the risk. The construction of buildings on the banks of the river allows the tides to flow naturally. The type of house is also related to the social culture of the community. The protection to maintain the architectural characteristics aims to preserve and develop the local architectural character. The preservation of local building techniques and materials in various architectural elements can provide appropriate protection status to avoid the degradation of environmental qualities (Jalkanen, Toivonen, & Moilanen, 2020) (Kulshreshtha et al., 2020). Development of projects and programs for the long-term conservation of these structures, including restoration and maintenance. The protection structure considered the unproductive functions into new functions. It aims to preserve the architecture. The old structure with a new function as an ecotourism-themed tourist information center, environmental museum, conference center, or hotel (Joshi et al., 2021).

The floating house gets the highest value of the best suitability criteria. The building adapts to the tides, waves, and movement of the river flow that identically to the riverbank site. It also brings dwellers closer to the daily custom of river-bound activities. Meanwhile, the stilt house has a good value in harmony with the ecosystem. The building foot is only a slight obstacle to the river flow. Buildings stand on the inundated riverbank facilitating dwellers or the rivers-bound activities. The value of both house types is significantly different from the value of the apartment. The multi-story building keeps residents away from the river. Although most effective in land use, the building foot will interfere with river flow. Strengthening the socio-cultural activities of the Musi riverbanks relates to the existence of the river as a cultural potential and local identity. Planning should support socio-cultural activities typical of riverbank communities (Al-Shams, Ngah, Zakaria, Noordin, & Sawal, 2013). Protection of the physical characteristics produces the traditional and the modern cultures correlated to wetlands. The management should involve the communities and associations in benefit-sharing for the conservation ecosystem. The conservation actions record historical structures such as buildings and settlements, hydraulic works, and transportation systems which are located in or closely related to wetlands. The record data are collected through descriptions, photography and drawings. The important action in this context includes the promotion of local culture in the sustainable use of building materials derived from wet materials for building construction. It maintains the ability and expertise of the community in the use of local materials. The planning concerns the sustainability of the use of these distinctive wetland production materials in contemporary buildings, either

in the context of traditional ways or in new innovative ways (Rattan, Sharma, Kumar, Saigal, & Shukla, 2021).

The buffer zone functions as a green and building-free corridor to support the function of riverbank wetlands as a reservoir for river overflow. Experts think 11-30 m is the right distance. The highest value is at 6,87 points. The distance that is too far (>30 m) will keep residents away from the river bank. On the other hand, a distance that is too close (0-10 m) will disturb the flow of rivers and natural wetland areas. Buffer zones provide natural space on the riverbanks to absorb pollution, purify and store water for reprocessing for urban water needs. Buffer zones are established at a safe distance to reduce the risk of flooding houses along the river. An estimate of the optimal size of the buffer area is used for the purpose of balancing ecosystem restoration and communal facilities. Riverbank planning can improve the urban ecological environment by creating green corridors by utilizing riverside landscapes, and will provide a good space for social interaction (Zhang, 2017). The planning buffer zone could strengthen socio-cultural by open river transportation routes. The practices take into account the existence of socio-cultural activities typical of river border communities.

Whereas, the third attribute is the structure option of the river edge wall affects the nature of the topography and tides. The natural option intends to maintain natural flows and tides on the riverfront wetlands. The natural option is no building block to the river. The older option separates housing areas and rivers to control flooding. Meanwhile, the riverfront platform borders the built area along the river bank by a continuous stilt plain. It facilitates community activities on the riverfront without river view blocking. The disturbance to the natural topography of the riverbank will affect the character of the natural landscape. Topographic changes through the intervention of building foundations, surface cover, and rearrangement of vegetation affect the interaction of elements in natural habitats. Consideration of connectivity between landscape elements is very important because it affects the flow of energy, materials, and organisms that support the provision of ecosystem services. The social-ecological approach considers multi-scale, one of which is to protect and maintain the function of the hydrological system. The addition of new elements will cause obstacles to the flow of water. These obstacles reduce water absorption, flow velocity, and tidal conditions (Heymans, Breadsell, Morrison, Byrne, & Eon, 2019). Further changes will have an impact on the socio-cultural and economic conditions of local residents. It also breaks open river transportation routes strengthening the character of the water city landscape.

In the last attribute, open space is built to perform as a reservoir to prevent flooding and for communities' daily activities. The riverfront is a potential open space for community activities. It is an interactive cultural landscape that also accommodates economic, cultural, and aesthetic purposes in a water-based city. The design should create an interactive and accessible riverbank to be oriented towards the river as a positive open space, view space, air, sun, and so on. It proposes an interactive, accessible, and beneficial urban water environment for city residents (Vian, Izquierdo, & Martínez, 2021). The community can carry out recreational, cultural, and scientific activities on the riverbank as a public open space (Hussein, 2006). Green corridors with pedestrian and bicycle paths provide public access to

the. Planning secures riverside green spaces from closure due to urban development. Moreover, it increases the connectivity of these spaces to other areas. The open space maintains water qualities, provides aquatic habitats, controls the flood, and extends a reservoir for ecosystem service conservation. Preservation of the landscape along the river as part of the urban ecosystem. The concept maintains spatial heterogeneity and landscape pattern. It affects biodiversity, ecosystem functions and services, generation and flow of ecosystem services across landscapes and thus human well-being. Potential sources of biodiversity and other ecosystems support complex and dynamic interactions between socioeconomic and ecological processes. This contributes to the adaptability of the city to deal with changes and disturbances.

The three alternatives with the best values have the same house type, buffer zone width, and river edge wall attributes. The three alternatives differ only in the choice of open space type. The highest house type value for a conservation riverside city is a floating house which has a buffer zone width of 11-30 m with a waterfront platform. The combination of attributes that become the best alternative allows community interaction with the river, as well as the choice of open space type, playgrounds are choices that are riverside settlements. The riverbank housing has several river-oriented planning criteria. It should take advantage of the natural potential of the riverbank as a visual feature. Planning also takes advantage of the area's benefits of riverside fresh air and sunshine. Residential buildings must adapt to the ebb and flow of the river to characterize the riverbank landscape. The distance between settlements and riverbanks must be close enough to facilitate residents' activities to the river, but also far enough to avoid obstruction of river flow due to buildings. The comfort of activities on the banks of the river is one of the important criteria. The riverside area is a natural public space that accommodates many of the daily activities of residents along the river.

Table 3. The Best Alternative Housings and Illustration

The Highest MAU	Housing Profile			
	House Type	Buffer Zone Width	River Edge Wall	Open Space Type
7.63	Floating house	11-20 m	Riverfront platform	Playground
7.62	Floating house	11-20 m	Riverfront platform	Park
7.61	Floating house	11-20 m	Riverfront platform	Green Space
				

CONCLUSION

The study recommendations are assessed on four basic elements of housing planning on the Musi riverbank in Palembang. Applicable practice should be supplemented with some additional attributes not listed in the options. Attributes of enrichment need to be considered in order to increase the potential for planning success. Each ecosystem has a specific character. Urban planning must integrate and adapt to the existing urban context and encourage interactions between biotic and abiotic elements as a hybrid of vegetation, surface cover and buildings. Connectivity between landscape elements and settlers will strengthen the bonds of mutual need and preservation that are key to sustainable planning.

The adaptive strategy is to balance social and ecological issues. An urban ecology approach requires an understanding of the complex and dynamic interactions of socio-economic and natural processes in cities. Not only considering the ecological sustainability, but also the socio-cultural sustainability of the local community. All these ecological processes become part of everyday life that affect human life itself. Riverbank wetland planning must respect and strategically incorporate public values to create plans that are not only ecologically new but also culturally valuable. It increases the appreciation of urban communities toward riverbank ecosystems.

The decision making by involving experts is a solution for regional planning of complex and complicated planning. The criteria are described as measurable criteria and indicators. The multi-criteria decision-making method combines all interests by providing several alternatives as the basis for making decisions. It can be adapted for use in many decision scenarios. The technique is simple enough to be used in a variety of situations. The problem at hand can be formally defined in terms of objectives, attributes, and various criteria to consider. It only requires calculating preferences for attributes. Each attribute can be evaluated separately for analysis and inspection. It makes evaluation easy to adapt to decision making. It is easier to understand for decision-makers who are not used to calculating monetary value in environmental impact. The planning must involve multiple stakeholders from various perspectives. The balance of solutions is determined by the selection of stakeholders. Each selected expert represents various considerations according to his field. The decision respects expert knowledge of the area to be the object of planning. The number of experts involved represents the various considerations required. Planning is considered by the transdisciplinary collaboration of various professionals from ecologists to planners in the debate about the balance between landscape needs and landscape services.

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REFERENCES

Alberti, A. R., & Cavalcante, C. A. V. (2022). A Multicriteria Model to Determine Maintenance Policy for a Protection System Subject to Imperfect Maintenance. In Multicriteria and Optimization Models for Risk, Reliability, and Maintenance Decision Analysis (pp. 203–226). Springer.

Al-Shams, A. R., Ngah, K., Zakaria, Z., Noordin, N., & Sawal, M. Z. H. M. (2013). Waterfront Development within the Urban Design and Public Space Framework in Malaysia. Asian Social Science, 9(10). https://doi.org/10.5539/ass.v9n10p77

BuHamdan, S., Alwisy, A., Bouferguene, A., & Al-Hussein, M. (2019). The application of multi-attribute utility theory for a market share-based design evaluation. International Journal of Housing Markets and Analysis.

Davidson, N. C., Dinesen, L., Fennessy, S., Finlayson, C. M., Grillas, P., Grobicki, A., … Stroud, D. A. (2019). A review of the adequacy of reporting to the Ramsar Convention on change in the ecological character of wetlands. Marine and Freshwater Research, 71(1), 117–126.

Dhabhalabutr, K. (2020). Community participation in architectural design and planning as a method for heritage site conservation and development: Case study Nong Kud Ting, Bungkan Province, Thailand. 2020 24th International Conference Information Visualisation (IV), 599–602. IEEE.

Heymans, A., Breadsell, J., Morrison, G. M., Byrne, J. J., & Eon, C. (2019). Ecological Urban Planning and Design: A Systematic Literature Review. Sustainability, 11(13), 3723. https://doi.org/10.3390/su11133723

Hussein, H. (2006). Urban Recreational Riverfronts: Successful Revitalisation Elements. Journal of Design and Built Environment, 2(1). Retrieved from http://ijie.um.edu.my/index.php/jdbe/article/view/4940

Jalkanen, J., Toivonen, T., & Moilanen, A. (2020). Identification of ecological networks for land-use planning with spatial conservation prioritization. Landscape Ecology, 35(2), 353–371.

Jansen, S. J. T. (2011). The Multi-attribute Utility Method. In S. J. T. Jansen, H. C. C. H. Coolen, & R. W. Goetgeluk (Eds.), The Measurement and Analysis of Housing Preference and Choice (pp. 101–126). Dordrecht: Springer Netherlands. Retrieved from http://link.springer.com/10.1007/978-90-481-8894-9

Joshi, D., Gallant, B., Hakhu, A., Silva, S. D., McDougall, C., Dubois, M., & Arulingam, I. (2021). Ramsar Convention and the Wise Use of Wetlands: Rethinking Inclusion. Ecological Restoration, 39(1–2), 36–44. https://doi.org/10.3368/er.39.01-02.36

Kulshreshtha, Y., Mota, N. J., Jagadish, K. S., Bredenoord, J., Vardon, P. J., van Loosdrecht, M. C., & Jonkers, H. M. (2020). The potential and current status of earthen material for low-cost housing in rural India. Construction and Building Materials, 247, 118615.

McInnes, R., Ali, M., & Pritchard, D. (2017). Ramsar and World heritage Conventions: Converging towards success. Ramsar: Ramsar Convention Secretariat.

Oktarini, M. F. (2020). Pendekatan Sosial Budaya dalam Penataan Permukiman Tepian Sungai Musi Palembang. Applicable Innovation of Engineering and Science Research (AVoER), 200–207.

Pritchard, D. (2018). Culture and nature: The case of the Ramsar Convention on wetlands. In Cultural and Spiritual Significance of Nature in Protected Areas (pp. 182–192). Routledge.

Rattan, R., Sharma, B., Kumar, R., Saigal, V., & Shukla, S. (2021). Ramsar Convention: History, Structure, Operations, and Relevance. Wetlands Conservation: Current Challenges and Future Strategies, 17–39.

Shafaghat, A., Ghasemi, M. M., Keyvanfar, A., Lamit, H., & Ferwati, M. S. (2017). Sustainable riverscape preservation strategy framework using goal-oriented method: Case of historical heritage cities in Malaysia. International Journal of Sustainable Built Environment, 6(1), 143–159.

Vian, F. D., Izquierdo, J. J. P., & Martínez, M. S. (2021). River-city recreational interaction: A classification of urban riverfront parks and walks. Urban Forestry & Urban Greening, 59, 127042.

Zhang, T. (2017). Study on the Influence of Urban River Topology on Landscape Design. DEStech Transactions on Social Science, Education and Human Science, (ssme). https://doi.org/10.12783/dtssehs/ssme2017/12961